

**IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF PENNSYLVANIA**

CARNEGIE MELLON UNIVERSITY,)	
)	
Plaintiff,)	
)	
vs.)	Civil Action No. 09-290
)	Judge Nora Barry Fischer
MARVELL TECHNOLOGY GROUP, LTD.)	
et al.,)	
)	
Defendants.)	

MEMORANDUM OPINION

I. INTRODUCTION

This is a patent infringement case brought by Plaintiff Carnegie Mellon University (“CMU”), against Defendants Marvell Technology Group, Ltd. and Marvell Semiconductor, Inc. (collectively “Marvell”), alleging that Marvell has infringed two of its patents, for which the Court conducted a four-week jury trial from November to December of 2012. (Docket No. 760). The jury rendered its verdict on December 26, 2012 in favor of CMU on infringement, validity, and willfulness, and awarded damages in the amount of \$1,169,140,271.00. (Docket No. 762).¹

Presently pending is “Marvell’s Motion for Judgment on Laches,” which has been fully briefed by the parties. (Docket Nos. 802-804; 823-826; 854; 858). The Court heard argument regarding this Motion on May 2, 2013, (Docket No. 873), with the transcript of these proceedings filed on May 15, 2013. (Docket No. 881).² Before addressing the contested factual and legal issues raised by Marvell’s laches defense, the Court was required to decide numerous

¹ As the parties are well aware of the factual and procedural background of this case and the Court has already written extensively on the facts of this case, *see* (Docket No. 901), the Court will limit its discussion to the background necessary for the resolution of the current motions.

² The parties likewise filed their hearing slides. (Docket Nos. 874; 875). Post-verdict, the parties have provided joint status reports with updates on pertinent technology, financial information and notices of related case authority. (Docket Nos. 889; 891; 893; 896; 897; 898; 905; 906; 907).

other contested post-trial motions filed by the parties which were potentially outcome determinative with respect to the laches defense. Therefore, after the hearing on post-trial motions, the Court proceeded to initially deny Marvell's motion seeking a mistrial in a decision dated August 23, 2013. (Docket No. 900). The Court then moved on to resolve the parties' challenges to the sufficiency of the evidence supporting the jury's verdict on liability, damages and willfulness and issued rulings resolving many of these matters on September 23, 2013. (Docket No. 901). In that same decision, the Court granted CMU's motion for a finding of willfulness and enhanced damages, but reserved ruling on the financial penalty to be imposed as a result of Marvell's willful infringement, an issue which will be determined in a later decision. (*Id.*). Now that the Court has resolved those related matters and sustained the jury's billion dollar verdict, the laches defense invoked by Marvell whereby it seeks to invoke the Court's equitable powers to reduce the jury's damages award by approximately \$620 million is ripe for disposition. (Docket No. 802).

The Court has carefully considered all of the parties' arguments and the voluminous evidentiary record (consisting of the entire trial record, as supplemented by the parties' post-trial submissions), which has required the Court to pause and debate the appropriate weight to be afforded to certain of the evidence and its legal rulings. After weighing the equities between the parties in light of the totality of the circumstances, and for the following reasons, Marvell's Motion for Judgment on Laches [802] is denied.

II. FINDINGS OF FACT

As the defense of laches is an equitable defense for which there is no right to a trial by jury, the Court sits as the trier of fact tasked with resolving factual disputes, weighing the credibility of the evidence and deciding the disputed legal issues between the parties. *See I/P*

Engine, Inc. v. AOL, Inc., 915 F. Supp. 2d 736, 740 (E.D. Va. Nov. 20, 2012); *see also*, *EBC, Inc. v. Clark Bldg. Sys., Inc.*, Civ. A. No. 05-1549, 2008 WL 4922107, at *4 (W.D. Pa. Nov. 13, 2008), *aff'd*, 618 F.3d 253 (3d Cir. 2010) (The “court's task is to weigh the evidence, resolve any conflicts in it, and decide for itself where the preponderance lies... . The Court is also required to assess the credibility of witnesses to determine whether the movant has demonstrated a factual and legal right to relief by a preponderance of the evidence.”). With this standard in mind, the Court now makes the following findings of fact and conclusions of law pursuant to Rule 52 of the Federal Rules of Civil Procedure.³ *See* FED. R. CIV. P. 52.

A. Prior to Issuance of the Subject Patents (late 1990's to March 2001)

From 1995 to 1998, Dr. Jose Moura, a tenured professor of Electrical Engineering at CMU and then doctoral student, Aleksandar Kavcic worked to develop a method addressing high density and media noise problems in magnetic recording. (Docket No. 673 at 42). On March 10, 1997, they submitted an invention disclosure form to CMU. (Pl. Ex. 156). And, in May 1997, they filed a provisional patent application claiming this method. (Pl. Ex. 1).

On March 8, 1998, Kavcic wrote the following email to Dr. Nersi Nazari, Vice President of Signal Processing at Marvell:

Hi Nersi, Somebody told me last week at our annual DSSC review here at Carnegie Mellon that Marvell has a detector that implements some of the approaches I suggested in my talk here. It is also in GLOBECOM 98 paper I sent you. Is there a write-up regarding this detector. Also I am going to graduate soon (May) and am on the look for jobs. [*sic*] Is Marvell hiring by any chance. Please let me know. My resume and downloadable publications are on my web page. The URL is Thanks, Alex.

³ Because laches is a fact-specific defense that requires consideration of all the circumstances and equities, the Court considers all of the relevant evidence in the record, including the evidence presented at trial and the parties' post-trial submissions of affidavits and supplemental exhibits. *See* § III, *infra*.

(Def. Ex. 1023; Docket No. 674 at 113:12-114:25). Dr. Nazari replied, in relevant part, “as far as I know our [*sic*] we do not have a product in line of your work, yet. Yes, we are hiring and I’ll read your resume on the web...” (Def. Ex. 1611). Kavcic replied discussing the different types of positions at Marvell in which he was interested and did not focus on any substantive points of the paper or the invention, or mention that he was seeking to patent his work. (*Id.*). The email included a link to his resume and collections of work. This link is no longer active.

The final patent application was filed on April 3, 1998. (Pl. Ex. 1). Later that year, Aleksandar Kavcic received his Ph.D. and left CMU to join the faculty at Harvard University. (Docket No. 673 at 149). CMU purged Dr. Kavcic’s email account sometime after he left the university. (Docket No. 858-1 at 28). CMU could not determine an exact date of when the email account was deleted but its technical witness estimated that the email account would likely have been purged “significantly under a year, most likely ... three to six months” after his departure under CMU’s email account maintenance policies. (*Id.*). CMU did not maintain a backup of Dr. Kavcic’s emails and they could not be located on CMU’s servers for purposes of this litigation. (*Id.*). Thus, CMU did not produce to Marvell any of Dr. Kavcic’s emails from the period of 1996-1998. (Docket No. 803 at ¶ 6). Dr. Kavcic likewise was unable to produce any emails from his Harvard account from 1998-2000 or any personal emails from 1996-2000. (*Id.*).

CMU’s ‘839 Patent was issued on March 13, 2001. (Pl. Ex. 1).

B. Marvell’s Development of the Accused Technologies (March 2001 to March 2003) and CMU’s Activities in the Same Time Period

On March 16, 2001, Gregory Burd at Marvell reported that he “started working on the Kavcic’s [*sic*] model” and believed it would be “a good starting point to implement it into the

simulator.”⁴ (Pl. Ex. 227; Docket No. 677 at 53-55). By March 23, 2001, the Kavcic detector was “running and debugged,” but the team at Marvell continued to investigate other alternatives after experiencing mixed results. (Def. Ex. 1060).

Independently, Dr. Moura wrote an email to Dr. Kavcic on April 13, 2001, asking him to compile a list of possible companies which may have an interest in the ‘839 Patent and suggesting that they meet with the Executive Director of the DSSC, Horacio Mendez, to discuss the information. (Def. Ex. 180). Dr. Kavcic responded a few hours later, listing a number of companies he thought may be interested in the technology and providing contact information for individuals he knew at those companies, including Nersi Nazari at Marvell. (Docket No. 874 at Ex. H at 14). When Dr. Kavcic was asked if “as of April 2001, he believed that any of the companies listed [] may be infringing your ‘839 patent,” he answered “I don’t think I believed that.” (*Id.*).

On May 16, 2001, Dr. Kavcic and Dr. Moura met with CMU’s Casey Porto, Horacio Mendez, and Dr. Bob White to discuss future plans with respect to the ‘839 Patent.⁵ (Def. Ex. 1522). Dr. Moura, a copious note taker, wrote during this meeting that they should identify companies that would be interested, “not disk manufacturers since they don’t manufacture chips, except IBM, but buy from: Integr. Circuits, Marvel [*sic*], TI, Lucent, Infineon, EMC as well, and any other company that makes chips.” (*Id.*). Dr. Moura further noted that “[c]hip manufacturers will make them (recording industry) [do] whatever they want them to do” and that “a viable strategy is to convince IBM and Seagate” to adopt the patented technology. (*Id.*). Dr. Moura also wrote that the CMU patent is an “optimal” solution, but “people are working on suboptimal” solutions, “adding little bells and whistles” and “people are trying to get around either because of

⁴ Dr. McLaughlin testified that Mr. Burd’s work on Dr. Kavcic’s detection scheme eventually led to the development of the KavcicViterbi simulator. (Docket No. 677 at 53-55; Pl. Ex. 93).

⁵ At the time, only the ‘839 Patent had issued.

patent or simpler solution.” (*Id.*). Following this meeting, Dr. White sent out two letters to Dr. Mark Kryder at Seagate and Thomas Albrecht at IBM Almaden in May 2001. (Def. Exs. 182; 185). The letters enclosed the ‘839 Patent and asked the companies to adopt the technology because CMU believed it offered advantages over current detection schemes. (*Id.*).

Dr. Kavcic later corresponded with Mr. Gregory Silvus of Seagate about the patents in October of 2001. (Def. Ex. 189). Mr. Silvus asked Dr. Kavcic if the patent claims specify whether the data dependent part happens in the trellis or in a post processor. (*Id.*). In response to this inquiry, Dr. Kavcic wrote:

Our patent does not use the words ‘noise prediction’, but the circuits are the same as in Park’s and Moon’s ‘noise prediction’. We derived the equations from the autoregressive model (it is a known fact that the autoregressive model equations and linear prediction equations are the same, so the two methods are the same). Yes, we address the ‘data dependent’ nature of the algorithm. We call it the ‘signal dependent’ nature. The data dependence is in the trellis and NOT in the post processor. Actually, the examiner had us write extra material to make sure that we do not use a post processor, which is a patent by Kelly Fitzpatrick.

(*Id.*).

By December 28, 2001, Mr. Burd had developed a media noise detector based on the “Kavcic model.” (Pl. Exs. 196, 279). Less than a week later on January 3, 2002, he sent an email to Nersi Nazari and Toai Doan enclosing his “kavcicPP.pdf” write-up and informing them that “Kavcic’s detection scheme is patented (assignee: Carnegie Mellon Univ., 2001).” (Pl. Ex. 280). The next day, Mr. Burd sent an email to Nersi Nazari, Toai Doan, and Ke Han again enclosing his “kavcicPP.pdf” write-up and reminding them “[a]nd of course as I mentioned earlier, Kavcic detector is also patented.” (Pl. Ex. 283). Around the same time as these email communications, on January 3, 2002, Marvell filed a provisional patent application directed to its media noise

processor. (Def. Ex. 1086). The provisional application referenced Kavcic's work and stated that "[e]ven though Kavcic's detector provides significant gains over conventional Viterbi detector in the presence of media noise, it is not very appealing due to implementation complexity." (Def Ex. 1086).

CMU's '180 Patent was issued on August 20, 2002. (Pl. Ex. 2). Marvell shipped its first sample chips integrating the KavcicPP method to Toshiba on August 30, 2002, to Fujitsu on October 7, 2002, and to Western Digital on October 8, 2002. (Docket No. 678 at 198, 208, 214). KavcicPP was later renamed "MNP" in January 2003 and years later the same was incorporated into Marvell's NLD technology, both of which are used on read channel chips and SOC chips (collectively, the "Accused Chips"). (Pl. Exs. 368; 823). In one of Dr. Wu's weekly emails from January 10, 2003, he stated "1. MNP enhancement: Greg and I discussed the approach of using a different noise whitening filter for each branch. **It turns out to be the original structure that Kavcic proposed in his paper.**" (Pl. Ex. 366 (emphasis added)). Marvell shipped sample chips containing MNP to Seagate on February 12, 2003. (Docket No. 868-14, *P-Demo 20*).

C. Evidence Regarding Potential Infringement by Marvell (Spring 2003 to August 2005)

The earliest evidence of CMU's knowledge of potential infringement of the patents-in-suit, is an entry on CMU's privilege logs from March 9, 2003, (a few days short of six years before the lawsuit was initiated), describing that Dr. Moura prepared "notes" concerning the potential infringement of the patents-in-suit at the direction of the Office of General Counsel for CMU. (Docket No. 812-1 at 5). The substance of these notes has been withheld by CMU under the attorney-client privilege; thus, there is no evidence presently before the Court that CMU had knowledge of Marvell's potential infringement as of that date. (*Id.*). Shortly thereafter, on April 5, 2003, Dr. Kavcic wrote to Dr. Moura:

Today I got two more independent confirmations about what the industry is building in their next generation chips. Direct quotes:

- a) "They are now building chips to tackle media noise"
- b) "Alek, the chip vendors are building chips EXACTLY as you said in your autoregressive noise paper"

I cannot tell you who told me because these people asked to remain anonymous. The companies who are building the chips are:

- 1) Hitachi (they may have inherited IBM's patents and license agreements, and IBM supported DSSC throughout)
- 2) Agere (they were previously Lucent, and I am not sure if they supported DSSC)
- 3) Marvell (they definitely did not support DSSC)**
- 4) ST Microelectronics (I am not sure if they are actually building signal dependent detectors, but we may have to check. However ST Microelectronics does not have a large market share anyhow)

(Def. Ex. 212 (emphasis added)). Dr. Moura responded "great" and that he would "pursue it from this end." (*Id.*). Dr. Moura then promptly engaged in privileged email communications with others at CMU regarding "possible infringement of patents-in-suit" on April 7, 9, 10, 11 and 12, 2003. (Docket No. 812-1 at 5-6).

At trial, Dr. Moura testified about his knowledge of Marvell's potentially infringing activity during the time period of 2001 until the April 5, 2003 emails:

Q: After looking at this e-mail, Dr. Moura, you responded to Dr. Kavcic and you said that you would pursue the issue on your end. Do you see that?

A: Yes.

Q: Did CMU file a lawsuit against Marvell in 2003?

A: Not in 2003, in 2009.

Q: CMU waited six years from the date of this particular e-mail to file a lawsuit?

A: No. I don't think so. CMU -- this is all speculation at this time, and CMU would not engage -- just look at this room -- not engage in these proceedings unless they did whatever they did to figure out that they needed to file a lawsuit. It's not something that CMU, as far as I know, takes lightly.

Q: So you're saying it was just -- you and Dr. Kavcic were just speculating that Marvell was using your patents back in 2003, is that it?

A: It's clear CMU doesn't know because we are the experts and we are talking to each other and we are figuring out what's going on. We don't have access to your documents or -- I mean Marvell's, Marvell's documents. So we hear or he hears or we hear; we speculate. And that's how you kind of start forming an opinion. It takes -- takes time; and this -- these proceedings, I tell you, it's not in anyone's interest to be here. It takes time to make such a decision.

Q: So is it your opinion, sir, that back in 2003, in this e-mail, you were -- you and Dr. Kavcic were speculating that Marvell was using your patents back then?

A: We are not speculating. We are hearing rumors that these things are happening. Look at what it says: Today I got two more independent confirmations about what the industry is building in their next generation chips. Direct quotes. They are now building chips to tackle media noise. Alek, the chip vendors are building chips exactly as you said in your autoregressive noise paper. So this is people that are in the know, we assume, that are telling us. We didn't look at your circuits. You didn't -- actually, that's interesting, because more or less at this time or maybe sometime earlier we looked on the web. The web is already available at that time, as you know. And we figured there was a marketing document sometime on the web that mentioned exactly things like this and there was a paper. And then when we tried to recover those things, those things disappeared from the web.

Q: So you don't have those papers, do you?

A: Unfortunately not.

Q: So when you say here you're going to pursue it on your end, did you do any investigation of Marvell's technology back in 2003?

A: For example, this I just told you. We went looking back for your materials; they had disappeared from the web.

....

Q: I'm asking you did you believe, sir, in 2003 that Marvell was using your patents?

A: Sir, in 2003 we had suspicions Marvell was -- we were hearing rumors that Marvell was using the technology.

Q: Did you believe, sir, in 2001 that Marvell was using your technology?

A: I think the rumors were much stronger in 2003 than in 2001.

Q: I'm -- did you believe in 2001 that Marvell was using your technology?

A: And I'm answering you, we heard rumors; the rumors became stronger as time went on.

Q: I'm not asking about rumors, sir. I'm asking you just for your view. Did -- did you believe in 2001 that Marvell was using your patent?

A: That's an answer that is not a yes or no. You are -- you hear things and you speculate. Is this true? Is it -- how do we know? I don't know, someone says. Do you -- do you have concrete proof? I don't. So I cannot answer to you no or yes. But I cannot say either way, yes or no. I suspect.

Q: You had a suspicion in 2001 that Marvell was using your technology.

MR. GREENSWAG: Objection, mischaracterizes his testimony.

THE WITNESS: This is nothing -- I'm hearing rumors. I have no idea what to do with the rumors. So the best thing to do is hope that they will come to their senses and license our patent that just came out.

Q: Did you -- did you believe in 2001 that anybody else was using your technology?

A: Well, to tell you the truth, I think in 2001 it may be too early because I think that's -- industry is very conservative. They kind of don't say, okay, let's switch gears. They had invested a lot in the Viterbis, so I don't think in 2001 that maybe industry jumped. I don't know. Maybe, maybe not. I have no idea.

Q: In 2001 did you do anything to investigate whether Marvell was using your technology -- strike that. In 2001 did you do anything to investigate whether Marvell was using your patent?

A: As I told you, we went -- somewhere in that time frame we approached Dr. White, and we also did a search on the web. We looked at some documents; the documents disappeared. We had -- we were -- we were trying to -- to see what's going on.

Q: And Dr. White then turned around and asked Dr. Kryder what his opinion was, and Dr. Kryder said: I don't think anybody's using the Kavcic/Moura patents; right?

A: And that was exactly because --

Q: Right, sir?

A: Can you refer back to the e-mail, please?

Q: It's Exhibit 214, sir.

A: Yeah. That's what I wanted to see. 2001. So this is exactly the point where I think industry is still not jumping into that, okay? Maybe even Marvell -- I don't know when you started copying the technology. I don't know, but maybe it's not 2001. I don't know.

(Docket No. 673 at 93-99). Dr. Kavcic explained at trial that he informed CMU of what he heard from the engineers at the Intermag conference.⁶ (Docket No. 674 at 108-110).

As Dr. Moura testified, Dr. White contacted Dr. Kryder at Seagate by email and requested assistance in determining whether the patents were being utilized by anyone in the industry. (Def. Ex. 13). Dr. Kryder was seemingly contacted by CMU because he was the cofounder and former director of the DSSC, but had left to take a position at Seagate, which was a DSSC member and held a royalty-free license to CMU's patents. (Docket No. 682 at 43-44).

To this end, Dr. White asked Dr. Kryder:

You may recall a year or so ago I was trying to get our sponsors who make drives to consider pushing to Kavcic-Moura algorithm dealing with correlated media noise with their channel-chip vendors. At Intermag Alex heard rumors that several chip suppliers are in fact developing chips that employ this algorithm. Is there any way you could help us confirm these rumors? This is obviously IP that Seagate has funded and has rights to through the DSSC.

(Def. Ex. 213). Dr. Kryder testified that "what I did was to go to my expert in signal processing here in Pittsburgh, [Erozan Kurtas], and asked him to -- and, you know, give me feedback on that." (Docket No. 682 at 49). Dr. Kryder replied to Dr. White's email on April 11, 2003, stating:

We are not aware of anyone utilizing the claims in the Kavcic-Moura patent although channel vendors may well be working in the area of designing detectors for signal dependent noise. Even before Kavcic and Moura filed their patent, there had been work by others on signal dependent noise. Hence their patent does not read on every implementation of channels that are designed for signal dependent noise. To really answer the question of whether their patent was being used or not, one would have to carefully look at the claims in their patent and then look, very carefully at how the channel chips being manufactured were implementing their detection algorithms. This is not easy to do.

⁶ Dr. Kavcic also testified at trial as to the identity of the engineers, Rick Brandt, Brooks Wilson and Ara Patapoutian. (Docket No. 674 at 108).

What you might want to do is send the patent to relevant people in each of the channel vendors making them aware of the patent and indicating that, if they are building channel chips that incorporate algorithms for signal dependent noise, they may be violating that patent, and if they are not, they may want to consider designing a chip based upon that patent. In either case, they may be interested in obtaining a license to that patent. If they are using something claimed by the patent, this may cause them to take a license, because, as I understand the law, they are liable for considerable higher damages if they knowingly use your patent after you have notified them of it.

(Def. Ex. 214). In stating that “[t]his is not easy to do,” Dr. Kryder testified that he meant “[b]asically it’s impossible to do because you cannot -- you cannot take apart a channel chip and understand what the algorithms are that are being processed through them.” (Docket No. 682 at 50). But, there is no evidence that Dr. Kryder communicated the alleged “impossibility” of an investigation to CMU at the time of this email. Dr. White forwarded the original email from Dr. Kryder to Dr. Moura and others at CMU, opining that “this suggests we continue on the path we discussed at our meeting.” (*Id.*). Dr. Moura, in turn, forwarded this email to Dr. Kavcic. (Def. Ex. 214).

Four months after Dr. Kryder’s communication, CMU sent fourteen letters to several companies in August 2003, including Marvell (specifically, to Vice President Dr. Pantas Sutardja and General Counsel Matthew Gloss), Toshiba, Western Digital, Fujitsu, Samsung, Hitachi, Maxtor, Agere, Infineon, and others asking if they would be interested in licensing the ‘180 and ‘839 patents.⁷ (Pl. Exs. 422; 431; Def. Exs. 225; 226; 227; 229; 230; 231; 232; 233; 234; 1573). Not all of these companies made read channel or SOC chips. (Docket No. 682 at 149-153). The “friendly letters” sent by CMU to the companies, including Marvell, stated that:

It has come to the attention of Carnegie Mellon University (“CMU”) that in recent months there has been an upsurge of

⁷ By June 2003, however, Marvell had made its first volume shipment of its MNP chips to Samsung. (Docket No. 678 at 241).

interest on the part of industry in correlation-sensitive adaptive sequence detection for signal-dependent noise and their application in data storage and retrieval using magnetic media. CMU is pleased to have been among the very first parties to have performed research in this area and has been awarded two United States patents, namely US Patent number 6,201,839 B1 and US Patent number 6,438,180 B1. I have taken the liberty of including copies of these patents along with this letter.

CMU has a long history of working with industry in order to bring the benefits of its research to the public and I would be happy to work with you to negotiate a license to these patents if that would be of interest to you. It is CMU's intention to work with industrial partners such as [Marvell Semiconductor] to establish reasonable terms that allow these companies to manufacture products covered by our patents on clear and equitable terms that benefit all the parties involved.

If you find the attached patents to be of interest, please feel free to contact me at the address given above so that together we can further investigate whether you would find it attractive to license CMU's proprietary technology.

(Pl. Exs. 422, 431). Agere and Infineon contacted CMU declining to license the technology; the rest, including Marvell, never responded. (*Id.*; Docket No. 826-1 at 45-48).

CMU's privilege logs⁸ reflect that there were some additional communications between CMU representatives (including Mahler, Mendez, Wooldridge, Ross, and White) and the inventors during 2003 which were "prepared at the direction of CMU's Office of General Counsel in anticipation of litigation and reflecting legal advice from counsel [regarding] possible infringement of the patents-in-suit."⁹ (Docket Nos. 812-1; 812-2; 812-3). As noted above, the earliest of these privileged communications is dated March 9, 2003 and is described as "notes"

⁸ The privilege logs presented by Marvell include those produced by CMU, Dr. Kavcic and K&L Gates. (Docket Nos. 812-1; 812-2; 812-3; 812-4).

⁹ The substance of these communications is not before the Court because Marvell did not timely seek to compel disclosure of the communications during the discovery period and the Court denied Marvell's post-trial motion to compel and/or to conduct an *in camera* review of such documents, for reasons that are explained in this Court's February 28, 2013 Memorandum Order, which is fully incorporated herein. (Docket No. 819). The Court further notes that Marvell did not seek reconsideration of this Memorandum Order. (*See generally* Docket Report Civ. A. No. 09-290).

prepared by Dr. Moura under the direction of the Office of General Counsel.¹⁰ (Docket No. 812-1 at 5). The other entries generally referencing communications concerning “possible infringement of the patents-in-suit” are dated in April, May, July and August of 2003. (Docket No. 812-1 at 5-8). None of the entries made during 2003 on the privilege logs reference Marvell specifically. (Docket Nos. 812-1; 812-2; 812-3; 812-4). But, Dr. Kavcic expressly stated that Marvell was potentially infringing in his April 5, 2003 email and the dates of the privileged communications between CMU representatives and the inventors certainly surround this disclosure. (Def. Ex. 212).

The following year, on July 6, 2004, Dr. Kavcic emailed Dr. Moura stating “[t]he patent – we need to put a law suit in process.” (Def. Ex. 246). It appears that this email prompted a series of privileged communications between the inventors and CMU representatives about “possible infringement,” but the log entries from this time period again do not mention Marvell specifically. (Docket No. 812-1 at 9-10). However, CMU admitted in its Answers to Interrogatories that “[b]y July 2004, CMU had been advised that Marvell had used a subroutine¹¹ named ‘kavcic.c,’ and that Marvell advertised to OEMs that a new Marvell chip (with an ID composed of several numbers and ending with 7500 and a letter) incorporated new technology to combat media noise, but did not include similar advertisements on its public web pages.” (Docket No. 816-1 at 4). At his deposition, Dr. Kavcic testified that he learned from former Marvell employees (Peter Kou and another individual whose name he could not recall) in 2004

¹⁰ The Court notes that Marvell’s summary of the privilege log references communications dated 1999. (Docket No. 812-1). In response, CMU has presented the affidavit of its counsel, Christopher Verdini, Esquire, which states that these entries contain typographical errors and should reflect that these communications were actually made in 2008. (Docket No. 826). Of course, the evidence appears undisputed that CMU’s patents had yet to issue and Marvell did not begin to infringe or even attempt to replicate Kavcic’s work until 2001.

¹¹ A “subroutine” is defined as “a set of computer instructions that performs a typical task, that is part of a larger computer program, and that can be used repeatedly.” See “subroutine”, Merriam-Webster, available at: <http://www.merriam-webster.com/dictionary/subroutine> (last visited 1/8/14).

“that Marvell has a routine in their detector with my name on it, kavcic.c.”¹² (Docket No. 816-4 at 10-12; *Kavcic Depo Vol I*, 7/13/10 at 213-18). Therefore, it is more than reasonable to infer that Dr. Kavcic was suggesting that CMU sue Marvell in his July 7, 2004 email. (Docket No. 246).

Around September 2004, Dr. Kavcic issued a memorandum to his review committee at Harvard discussing his research, teaching, and program building activities. In one section of his report he wrote:

The work that characterized my Ph.D. thesis is the formulation of the optimal signal detector for the magnetic recording channel that is sensitive to intersymbol interference, the data-dependent character of the noise and signal nonlinearities. Of all my work so far, this has made the biggest impact in the magnetic recording industry. **All major read channel manufacturers (Agere, Marvell, ST-Microelectronics) utilize a form of the detector I proposed in their latest generations of read channel chips.**

(Def. Ex. 373, Docket No. 802-3 at 12 (emphasis added)). He also added that “[t]he industrial community recognizes the model to be a very valuable tool. Several researchers in industry and in academic institutions use this as the standard model for the magnetic recording channel when simulating detectors and decoders for these channels.” (*Id.*). There is no evidence that this memorandum was published beyond transmission to the Harvard Review team. Nor is there any evidence that CMU or Dr. Moura ever saw this memorandum. Yet, it is of moment that Dr. Kavcic listed the same entities in this communication that he had earlier alleged were infringing his work in his April 5, 2003 email to Dr. Moura. (*See* Def. Ex. 212).

¹² Dr. Kavcic explained that he had approached these individuals in the hallway outside a meeting at Link-A-Media’s Santa Clara Offices and asked them if they had any information about Marvell’s read channel chip designs. (Docket No. 816-4 at 11-12; *Kavcic Depo Vol I*, 7/13/10 at 212-13). He added that “one or both of the people said that they don’t know much about what is going on at Marvell because Marvell keeps things compartmentalized, so that they won’t reveal details of their chips to all the employees, but that only a few people got to know everything about chips.” (*Id.* at 221). (Dr. Kavcic was working as a consultant at Link-A-Media at the time but concluded his consulting work with that entity by 2007. (*Id.* at 214)).

On November 11, 2004, Junya Suwanai of Fujitsu, “a customer for Marvell’s read channel i.e. 5575M, 7500M,” corresponded with Marvell, stating that Fujitsu had received a license offer for the CMU Patents. (Pl. Ex. 477). He wrote that “since it seems that these patents might be related to read channel, we would like to know, by the end of November, your opinion regarding relationship between CMU’s Patents and the above Marvell lead [sic] channel and the specific grounds/reasons for such opinion.” (*Id.*). Marvell did not respond to this communication. (Docket No. 761-5, Joint Ex. C at 12-13, *Armstrong Depo.* at 531-535). There is no evidence that CMU was involved with this communication which only appears to have come to light during discovery in this case.

CMU’s privilege logs demonstrate that there were increased privileged communications among CMU representatives and the inventors during 2004 about “possible infringement of the patents-in-suit.” (Docket Nos. 812-1; 812-2; 812-3; 812-4). Based on the entries contained in these records, CMU’s general counsel, Mary Jo Dively, Esquire, was specifically included in this correspondence in July of 2004. (Docket No. 812-4 at 3). Further, CMU sought assistance regarding analysis of possible infringement of the patents-in-suit from outside counsel at K&L Gates, Holly Towle, Esquire,¹³ in August of 2004. (*Id.*). Similar communications continued into 2005. (Docket No. 812-1 at 14-16). The first explicit reference in the privilege logs to potential infringement by Marvell is contained in an entry dated March 10, 2005, which states that Attorneys Dively and Towle engaged in an “[e]mail thread prepared in anticipation of litigation and for purposes of seeking and providing legal advice [regarding] **CMU/Marvell litigation**.” (Docket No. 812-1 at 15 (emphasis added)). The privilege logs contain references to additional general communications about “possible infringement” in April, June, August and September of

¹³ Ms. Towle is a partner at K&L Gates and works out of the Seattle Office.

2005 between CMU representatives, outside counsel and the inventors, but there are no additional references to Marvell in the privilege log entries in this timeframe. (*Id.* at 15-16).

D. After Issuance of Marvell's Patent (August 2005 to Filing of Complaint)

Marvell's '585 Patent, which cited the '180 and '839 Patents and Dr. Kavcic and Dr. Moura's paper as prior art, was issued on August 16, 2005. (Def. Ex. 266). At that time, Marvell's provisional patent application it had previously filed on January 3, 2002 became available for inspection at the Patent and Trademark Office. (Docket Nos. 803 at ¶ 42; 825 at ¶ 42). There is no evidence that Marvell marked its read channel chips with the '585 Patent.¹⁴

On January 16, 2006, the Director of CMU's Center for Technology Transfer and Enterprise Creation, Mr. Robert Wooldridge, prepared a spreadsheet titled "Highly Speculative Income Streams" listing a number of technologies owned by CMU and the speculative amounts of income which could be generated from same. (Def. Ex. 272). One entry reads "Technology: Hard Disk Head Noise Reduction; Company: Marvell; Royalties: \$2,000,000; Key Hurdle: Possible Infringement; Status: We need to strategize and make a decision." (*Id.*). During trial, Mr. Wooldridge testified:

Q: Did you write that, possible infringement?

A: Yes.

Q: What did you mean by that?

A: It means that one of our researchers, one of our faculty members, at one-time had said to me, I think someone may be infringing on my patent. Nothing more.¹⁵

¹⁴ Dr. Kavcic testified that he first reviewed Marvell's '585 patent "sometime in 2006" in preparation for a publication that was written in 2007 and released in 2008. (Docket No. 674 at 220-21). Although Dr. Kavcic was no longer with CMU at the time, CMU's privilege logs reflect that he sent and received correspondence which was prepared "at the direction of CMU's Office of General Counsel in anticipation of litigation" throughout this general time period. (*See* Docket Nos. 812-1; 812-3).

¹⁵ Despite his testimony that he was aware of "possible infringement" only from a one-time conversation with a "faculty member," the Court notes that Wooldridge was included on correspondence before the date of his spreadsheet (January 16, 2006) concerning "possible infringement of the patents-in-suit" which has been withheld as privileged in this case. (Docket No. 812-1). Of note, entries on January 3 and 4, 2006, reflect that he received emails from Carl Mahler which contained "legal advice from counsel (M. Dively, K&L Gates) re: possible infringement of patents-in-suit" and from Mary Jo Dively providing "legal advice re: potential IP suits." (Docket

(Docket No. 682 at 103). Mr. Wooldridge also testified that as of the date of his spreadsheet, CMU had not initiated any investigation to determine if Marvell was infringing or not, had not hired anyone (like Dr. McLaughlin) to conduct such investigation, and added that no one from CMU had advised Marvell of its infringement concerns. (*Id.* at 213-14). Two months later, Dr. Thomas Kailath nominated Dr. Moura for the National Academy of Engineering. (Docket No. 802-4). Of note, the nomination form lauded Dr. Moura’s work in developing the Kavcic-Moura detector described in CMU’s patents:

[A]ll major read channel manufacturers are producing chips with versions of the detector. This represents the single most important invention in the development of magnetic recording read channel electronics in the 90’s. Their AR media noise model is today the standard modeling tool adopted by the entire magnetic storage industry.

(*Id.*).

CMU generally claims that it performed an “evolving analysis” of the patents between 2006 and 2008, pointing to Mr. Wooldridge’s deposition testimony for support. (Docket No. 826-1 at 59). But, Mr. Wooldridge clarified during his deposition that CMU had conducted only a “preliminary analysis as to whether there should be a longer conversation” about the potential infringement of the patents during this timeframe. (Docket No. 826-1 at 60, *Wooldridge Depo* at 111). Mr. Wooldridge testified as CMU’s Rule 30(b)(6) designee on these issues. CMU has submitted no other evidence supporting a finding that anything more than a “preliminary analysis” was completed around this time, disclosing only in its privilege logs that there were

No. 812-1 at 16). He was likewise involved in similar correspondence subsequent to the date of the spreadsheet. (*Id.* at 16-19). In any event, the fact that Wooldridge was copied on these emails does not wholly undermine his testimony about the extent of his knowledge of possible infringement by Marvell because he is not a lawyer and appeared to the Court that he did not seem to appreciate more complex aspects of this case as he testified. (*See* Docket No. 682). Given his demeanor and testimony, it is the Court’s impression that, at the time, Wooldridge likely did not comprehend the significance of what Mahler and Dively, both lawyers, may have been telling him in their correspondence.

some continuing internal discussions among the inventors, CMU representatives and occasionally, outside counsel from K&L Gates regarding possible infringement of the patents-in-suit. (Docket No. 812-1).¹⁶ During this same timeframe, Marvell made significant financial investments in the design and production of its NLD chips and made initial shipments of these chips to its customers in 2007. (Docket No. 678 at 242).

In 2008, Drs. Kavcic and Moura grew dissatisfied with the lack of any action taken by CMU to enforce the patents and they sought to obtain the patents from CMU through a release so that they could pursue enforcement activities against Marvell and possibly other entities believed to be infringing. (Def. Ex. 306). They contacted Astro Teller of Cerebellum Capital¹⁷ to assist them in their pursuit of the patents. (*Id.*). In the context of these discussions, Dr. Kavcic told Mr. Teller that “[t]he reality is that CMU will be very reluctant to do anything with these patents in the future, so the only way out, in my opinion is to push for a release [to me and Dr. Moura].” (*Id.*). Subsequently, in May of 2008, Mr. Teller approached Ms. Tara Berstrand of CMU’s Tech Transfer Office by email regarding the subject patents. (Def. Ex. 306). In this email, Mr. Teller recounted a conversation that he had with Dr. Moura:

He mentioned to me recently that he and an old student of his (Alek Kavcic) filed two patents about 10 years ago that **they would like to see CMU be more active about and that it is clear CMU is not going to be more active about**. Particularly, it seems that the 6 year anniversary of putting some companies on notice that they think are the most likely infringers is coming up in about 1 year.

(*Id.* (emphasis added)). Accordingly, Mr. Teller sought a release of the patents back to the inventors in order to pursue an infringement lawsuit. (*Id.*). Ms. Berstrand replied that the

¹⁶ Carl Mahler was not deposed and was not called as a witness by either party. (See Docket No. 901 at 12, n.15).

¹⁷ Mr. Teller knew Dr. Moura because his wife, Manuela Veloso, was his Ph.D. thesis advisor while he was a student at CMU. (Def. Ex. 306). Dr. Kavcic testified that he had no knowledge of Mr. Teller’s business and only knew that he was a former student of Dr. Moura’s wife. (Docket No. 673 at 103-105).

University would not permit a release because it would compromise the other licenses of the ‘180 and ‘839 Patents to DSSC members. (*Id.*). In response to this forwarded string of emails, Dr. Kavcic expressed on June 3, 2008 that he believed CMU was reluctant to do anything with these patents, affirming Mr. Teller’s parallel statements to CMU in his letter. (*Id.*). Dr. Kavcic further wrote that Marvell and a number of other companies were potential infringers. (*Id.*). The inventors and Mr. Teller did not further pursue their efforts to obtain a release of the subject patents. Based on the privilege logs, Dr. Kavcic’s concerns did eventually prompt CMU into increased activity concerning the potential infringement of the patents-in-suit and, on November 14, 2008, Dr. Kavcic was communicating directly with lead trial counsel, Mr. Douglas Greenswag, Esquire at K&L Gates, who was providing CMU with legal advice concerning what is described as the “CMU/Marvell Patent Litigation.” (Docket No. 812-1 at 50).

E. Pre-Suit Investigation and Filing of Complaint to Present

On March 6, 2009, CMU filed this lawsuit. (Docket No. 1). In its Complaint, CMU accused Marvel of directly, indirectly, contributorily and/or by inducement infringing its ‘839 and ‘180 Patents in certain of its “read-channel integrated circuit devices” or

products that incorporate read-channel integrated circuit devices, including but not limited to Marvell’s 88c3000, 88C3100, 88C4200, 88C4300, 88C5500, 88C7500, 88C7500M, and 88i5520 series of products and/or any additional Marvell hardware and/or software components that incorporate or implement noise predictive detection including, but not limited to, pattern dependent noise prediction, signal dependent noise prediction, data dependent noise prediction, and/or branch label noise prediction, for detecting data stored on a hard-disk drive.

(Docket No. 1 at ¶¶ 15, 22). CMU admits that it was able to bring the lawsuit without having first gained access to Marvell’s confidential chip designs and circuitry. (Docket No. 804 at 13). CMU has sought attorney’s fees for services rendered by its counsel, K&L Gates, for the period

of “late 2008 to March of 2009” in the amount of \$350,000.00 under 35 U.S.C. § 284.¹⁸ (Docket No. 811-1 at ¶ 12). K&L Gates asserts that its pre-filing investigation included the following tasks, a “detailed review of the patents in suit, file histories and related technical materials, interviews with the inventors and key CMU personnel, identification and analysis (to the extent possible) of Marvell read channel products, analysis of CMU’s documents, analysis of infringement and validity issues, and preparation of and filing the Complaint.” (*Id.*). This pre-filing investigation allegedly took 711.6 attorney hours to complete. (*Id.*).

The decision to file suit was made by individuals “at the top administration of the university.” (Docket No. 826-1 at 60, *Wooldridge Depo* at 111-12). Then-President of CMU, Dr. Cohon, admitted that CMU never reached out to anyone at Marvell to discuss the alleged infringement of the patents before initiating this lawsuit. (Docket No. 671 at 208:10-15). In addition, Dr. Kavcic conceded at trial that he had numerous communications with Marvell representatives throughout the years but never mentioned any issues to them concerning Marvell’s infringement of the patents. (Docket No. 674 at 102-03). Tellingly, Dr. Kavcic’s only explanation for not discussing this matter with anyone at Marvell was that, “it’s not my job to inform anything of anybody to anybody because this is property of CMU.” (*Id.*). Later, he testified that it “was CMU’s job to communicate [with Marvell] because CMU owned the

¹⁸ In support of the Motion for Attorneys’ Fees, Attorney McElhiney avers as follows:

(i) Pre-Filing Investigation and Complaint

10. Between late 2008 and March 2009, counsel for CMU conducted its pre-filing investigation, prepared its complaint, and performed other initial tasks.

11. During that phase, the time spent by certain of the timekeepers listed above was 711.6 hours. The tasks performed included detailed review of the patents in suit, file histories and related technical materials, interviews with the inventors and key CMU personnel, identification and analysis (to the extent possible) of Marvell read channel products, analysis of CMU’s documents, analysis of infringement and validity issues, and preparation of and filing the Complaint.

12. The value of the work performed, at the rates then in effect, was approximately \$350,000.

(Docket No. 811-1 at ¶¶ 10-12).

patents.” (*Id.*). However, pursuant to CMU's policy, half of any proceeds that CMU realizes from the patents, including a portion of any net damages awarded to CMU in this lawsuit, are split between the inventors, Dr. Kavcic and Dr. Moura. (Docket No. 671 at 194–195).

The record is undisputed that between 2003 and 2009, Marvell made significant financial investments in its MNP technology, introduced additional lines of chips containing the MNP (including the EMNP and NLD/NLV series of chips) and sold 2.34 billion Accused Chips through July of 2012. The parties’ status reports reflect that an additional 458,143,144 Accused Chips have been sold as of November 2, 2013, which consists of sales of 363,752,585 Accused Chips from July 29, 2012 to August 3, 2013 (\$181,876,292.50) and 94,390,559 Accused Chips from August 4, 2013 to November 2, 2013 (\$47,195,279.50). (Docket Nos. 901 at n. 136; 907). After the verdict, Marvell started to remove such technology from its chips but continues to sell products containing the patented methods because of the stage of the production of the chips in relation to Marvell’s lengthy sales cycle; such infringing sales are expected to continue throughout 2014. (Docket No. 891).

F. Relevant Procedure as to Instant Motion for Judgment

Marvell raised the defense of laches in its Answer and Amended Answer, (Docket Nos. 13 at 6; 116 at ¶¶ 28, 29), but neither party filed a motion for summary judgment on the defense of laches nor a motion in limine directly challenging same. However, the Court granted a related motion in limine brought by Marvell and precluded CMU from recovering pre-suit damages for infringement of the ‘839 Patent based on CMU’s failure to require its licensees (i.e., Seagate) to mark products containing the ‘839 Patent before selling hard drives containing such technology to third parties. *See Carnegie Mellon University v. Marvell Semiconductor, Ltd, et al.*, 906 F. Supp. 2d 399, 413 (W.D. Pa. 2012). Such ruling did not limit CMU from pursuing pre-suit

damages as to the infringement of the ‘180 Patent. *Id.* Prior to trial, Marvell requested that the Court present the defense of laches to the jury on an advisory basis. The Court declined such invitation, for reasons stated in a Memorandum Order dated November 28, 2012 and deferred consideration of Marvell’s laches defense until post-trial proceedings. (Docket No. 670). The jury rendered its verdict on December 26, 2012 in favor of CMU on infringement, validity, and willfulness, and awarded damages in the amount of \$1,169,140,271.00. (Docket No. 762). This damages award includes pre-suit damages as to the ‘180 Patent only, as the Court’s instructions to the jury and verdict slip expressly precluded any award of damages to CMU for pre-suit infringement of the ‘839 Patent. (*Id.*).

In post-trial proceedings, the parties litigated a number of issues related to the defense of laches and the Court’s procedures for resolving such disputes. Of note, Marvell sought an evidentiary hearing, a request which CMU opposed and the Court denied. (Docket Nos. 778, 780, 781). The Court instead permitted the parties to present affidavits and to conduct depositions challenging the averments in same, although no depositions were conducted by the parties.¹⁹ (Docket No. 781). Marvell also moved to compel CMU to disclose communications set forth in its privilege logs in an effort to demonstrate the date and level of CMU’s knowledge of Marvell’s infringement in this case. (Docket Nos. 800, 801). The Court agreed with CMU that Marvell’s motion was untimely as filed outside the discovery period and denied this motion as well. (Docket Nos. 816, 819). However, as is noted above, the Court did consider the produced privilege logs in conjunction with all of the other evidence of record to determine *when* CMU had knowledge of Marvell’s potential infringement and to assess the credibility of the

¹⁹ In this regard, the Court denied Marvell’s motion to file certain information under seal and a later motion for reconsideration of the initial order. (Docket Nos. 838, 856, 864).

evidence presented. The Court did not secure nor did it review the actual communications which were described in said logs.

The motion for judgment on laches has been exhaustively briefed by the parties, including their submissions of proposed findings of fact and conclusions of law and additional evidence beyond the trial record has been presented to and considered by the Court regarding this motion. (Docket Nos. 802-804; 823-826; 854; 858). Oral argument was heard on May 2, 2013. (Docket Nos. 873; 881). The Court has issued rulings resolving a number of other post-trial motions filed by the parties, (Docket No. 901), and after further reviewing all of the relevant materials before the Court and due consideration, is now prepared to address this hotly contested motion.

III. LEGAL STANDARD

It is well established that there is no explicit statute of limitations barring patent infringement claims. *A.C. Aukerman Co. v. R.L. Chaides Constr. Co.*, 960 F.2d 1020, 1030 (Fed. Cir. 1992). However, 35 U.S.C. § 286 expressly limits the potential recovery of damages in a patent infringement case to a period of six years prior to the date that the infringement claim was filed. *See* 35 U.S.C. § 286 (“Except as otherwise provided by law, no recovery shall be had for any infringement committed more than six years prior to the filing of the complaint or counterclaim for infringement in the action.”). Pursuant to 35 U.S.C. § 282, laches is a cognizable equitable defense to a claim of patent infringement. *Aukerman*, 960 F.2d at 1028. Under the doctrine of laches, federal courts “will not assist one who has slept upon his rights, and shows no excuse for his laches in asserting them.” *Lane & Bodley Co. v. Locke*, 150 U.S. 193, 201 (1893). The laches defense is flexible in its application, and the Court must look at all of the particular facts and circumstances of each case and weigh the equities of the parties.

Aukerman, 960 F.2d at 1032 (citing *Bott v. Four Star Corp.*, 807 F.2d 1567, 1576 (Fed. Cir. 1986)). If successful, a laches defense effectively reduces the damages awarded by the jury at trial but “bars relief only for damages accrued *prior* to suit.” *Gasser Chair Co., Inc. v. Infanti Chair Mfg. Corp.*, 60 F.3d 770, 773 (Fed. Cir. 1995) (emphasis added); *see also Univ. of Pittsburgh v. Varian Med. Sys., Inc.*, Civ. A. No. 08-1307, 2012 WL 952849, at *2 (W.D. Pa. Mar. 19, 2012) (Schwab, J.).

In order to prevail on the defense of laches, the defendant has the burden of proving two elements by a preponderance of the evidence: (1) unreasonable and inexcusable delay by the plaintiff in bringing suit, measured from the date the plaintiff knew or should have known of the infringement; and (2) material prejudice suffered by the defendant as a result, which may be evidentiary or economic in nature. *Gasser*, 60 F.3d at 773 (collecting cases). However, if the defendant is able to prove that the plaintiff knew or should have known of the infringement more than six years before the infringement suit was filed, these two elements are presumed and the burden shifts to plaintiff to disprove laches. *Ultimax Cement Mfg. Corp. v. CTS Cement Mfg. Corp.*, 587 F.3d 1339, 1349-50 (Fed. Cir. 2009). In either event, the application of the defense of laches “remains an equitable judgment of the trial court in light of all the circumstances.” *Aukerman*, 960 F.2d at 1036. Thus, the ultimate determination of laches is committed to the sound discretion of the Court. *Id.* at 1028; *see also Wang Labs., Inc. v. Mitsubishi Elecs. Am., Inc.*, 103 F.3d 1571, 1576 (Fed. Cir. 1997).

IV. DISCUSSION

Marvell sets forth alternative arguments in support of its Motion for Judgment on Laches. (Docket Nos. 804, 854). Initially, Marvell contends that the presumption of laches applies in this case because the evidence it has presented demonstrates that CMU had constructive knowledge

of its allegedly infringing actions before March 6, 2003, or more than six years prior to the filing of this lawsuit on March 6, 2009, and that CMU has failed to rebut the applicable presumption by proving that its delays in bringing the case were reasonable or that Marvell did not suffer economic or evidentiary prejudice resulting from the delays. (Docket No. 804 at 8). Alternatively, Marvell maintains that even if the presumption does not apply, it is entitled to judgment on laches because its evidence proves that CMU unreasonably delayed this litigation, causing it both economic and evidentiary prejudice. (*Id.* at 16-20). CMU opposes Marvell's Motion and argues that its damages should not be limited because laches has not been established as a matter of law. (Docket No. 823, 858). From CMU's perspective, the presumption of laches should not apply because Marvell has established that before the operative date (March 6, 2003) CMU had only, at most, heard "rumors" or "suspicions" of possible infringement of the patents by chip manufacturers and had identified Marvell as a potential licensing target. (*Id.*). CMU also argues that its delays in bringing suit, if any, were reasonable and that Marvell has suffered neither economic nor evidentiary prejudice with a sufficient causal nexus to the alleged delays. (*Id.*). Finally, CMU claims that a finding of laches in this case is inappropriate because a weighing of the equities between the parties favors its position. (*Id.*).

The Court will address the parties' arguments as to each of these issues, in turn.

A. The Presumption of Laches

The first issue in dispute between the parties is whether Marvell has demonstrated by a preponderance of the evidence that CMU had actual or constructive knowledge of Marvell's infringement of the patents prior to March 6, 2003, which would raise a presumption in favor of Marvell. (Docket Nos. 804, 823). Marvell points to various events which occurred in 1998, 2001 and 2002 in support of its efforts to invoke the presumption. (Docket No. 804). CMU

contends that Marvell's evidence is both factually and legally insufficient. (Docket Nos. 823, 858).

Before directly addressing the parties' arguments on these issues, the Court notes that several general legal principles and its prior rulings in this case limit the scope of Marvell's laches defense to the extent that it seeks to invoke the presumption. To this end, the law is well-settled that the laches clock does not commence until the date that the patent in dispute issued. *See Aukerman*, 960 F.2d at 1032 ("the period does not begin prior to issuance of the patent."); *see also Pei-Herng Hor v. Ching-Wu Chu*, 699 F.3d 1331, 1335 (Fed. Cir. 2012) (citing *Aukerman*, 960 F.2d at 1032). Here, the laches clock could potentially commence at different times for the '839 and '180 Patents because they were issued on separate dates, i.e., the '839 Patent was issued on March 13, 2001 and the '180 Patent was issued on August 20, 2002. (Pl. Exs. 1; 2); *see also Meyers v. Brooks Shoe Inc.*, 912 F.2d 1459, 1462 (Fed. Cir. 1990) (holding that district court erred by "basing its decision on a single laches period for all three patents" when they were all issued at different times). However, a successful laches defense operates to bar a plaintiff from recovering pre-suit damages for infringement. *Gasser*, 60 F.3d at 773. Therefore, Marvell's laches defense can only possibly succeed with respect to claims for which CMU was awarded pre-suit damages at trial. *Id.*

At this stage of these proceedings, only the date of the issuance of the '180 Patent (August 20, 2002) is relevant because this Court previously held that CMU could not recover pre-suit damages as to the '839 Patent. *See CMU*, 906 F. Supp. 2d at 413.²⁰ In fact, at trial, the jury was instructed that it could not award pre-suit damages as to the '839 Patent; the verdict slip

²⁰ In this decision, the Court held that pre-suit damages for the '839 Patent were barred because CMU failed to comply with 35 U.S.C. § 287(a) by requiring its licensees to mark the '839 Patent on products the licensees sold to third parties and *CMU*, 906 Supp. 2d at 413. As such, CMU was precluded from pursuing pre-suit damages for infringement of the '839 Patent. *Id.*

used by the jury explicitly stated that “CMU cannot collect damages from before its filing of this lawsuit on March 6, 2009 for the ‘839 Patent” and no such damages were awarded. (Docket No. 762). Instead, the jury ultimately determined that both the ‘839 Patent and ‘180 Patent were infringed by the accused chips and simulators, adopted CMU’s damages theory which valued the infringement of both patents together, and awarded damages of \$1,169,140,271.00 from Marvell’s sales during the period of March 6, 2003 to July 28, 2012.²¹ (See Docket Nos. 762; 901). All told, in order to successfully invoke the presumption, Marvell must demonstrate by a preponderance of the evidence that CMU knew or should have known of Marvell’s infringement of the ‘180 Patent during the time period of August 20, 2002 to March 6, 2003 or a period of a little over six months. See *Aukerman*, 960 F.2d at 1037; see also *Univ. of Pittsburgh*, 2012 WL 952849, at *2 (citation omitted).

With this background, Marvell’s arguments as to the applicability of the presumption are rejected by the Court because it has not pointed to any significant evidence of CMU’s alleged knowledge of its infringement of the ‘180 Patent between August 20, 2002 and March 6, 2003. (See Docket No. 803). Marvell does not argue that CMU had actual knowledge of its infringement of either the ‘180 Patent or the ‘839 Patent (to the extent it remains relevant) but focuses on CMU’s alleged constructive knowledge of infringement at that time. (See Docket No. 804 at 8). As to constructive knowledge, “[t]he plaintiff is chargeable with such knowledge as he might have obtained upon inquiry, provided the facts already known by him were such as to put upon a man of ordinary intelligence the duty of inquiry.” *Advanced Cardiovascular Sys., Inc. v. Scimed Life Sys., Inc.*, 988 F.2d 1157, 1162 (Fed. Cir. 1993). On this point, the only evidence presented by Marvell during the relevant period (from August 20, 2002 to March 6, 2003)

²¹ Again, the damages calculation starts on March 6, 2003 because CMU is precluded by 35 U.S.C. § 286 from claiming damages prior to that date. See 35 U.S.C. § 286.

consists of several entries contained in privilege logs dated in September and December of 2002. (*Id.* at ¶ 25). Upon review of same, the Court finds that none of the entries reference the ‘180 Patent or indicate that there was knowledge of possible infringement of the ‘180 Patent (or even the ‘839 Patent) at that time by any entity and there are no references to Marvell in any of the entries. (Docket No. 812-1 at 4-5). Indeed, the September 2002 entries reflect that CMU sought advice of outside counsel concerning possible infringement of the “B2 patent” which is not at issue in this litigation²² and the December 2002 entries concern its receipt of legal advice about the “disk drive market” and “data storage industry.” (*Id.* at 5). Accordingly, the Court holds that Marvell has failed to demonstrate by a preponderance of the evidence that the presumption of laches applies in this case. *See Aukerman*, 960 F.2d at 1032.

Before moving on, the Court alternatively recognizes that even if the pre-August 20, 2002 evidence upon which Marvell relies was deemed relevant to the defense of laches as to the infringement of the ‘180 Patent, it is likewise insufficient to warrant the invocation of the presumption of laches. First, the email Dr. Kavcic sent to Dr. Nazari in 1998, while he was still a graduate student at CMU and seeking potential job opportunities at Marvell, (Def. Ex. 1023), was sent prior to the issuance of either patent and is therefore largely immaterial to the laches inquiry. *See Aukerman*, 960 F.2d at 1032. Further, the content of that email is not sufficient to demonstrate any awareness by CMU (or Dr. Kavcic) that Marvell was developing a detector that copied his then-unpatented work. (*Id.*). Instead, the email states that Dr. Kavcic heard that “Marvell has a detector that implements some of the approaches” that he suggested during a speech and Dr. Nazari responded by denying that Marvell had “a product in line of your work,

²² The “B2” patent refers to U.S. Patent No. 5,693,426, titled “Magnetic recording medium with B2 structured underlayer and a cobalt magnetic layer,” which was invented by Li-Lien Lee, David Lambeth and David Laughlin. (*See* Docket No. 816 at n.9). “This patent relates to magnetic storage media for use in disk drives.” (*Id.*). CMU sued Fujitsu to enforce the B2 patent in 2002 and that case was resolved in 2004. *See CMU v. Fujitsu Ltd, et al.*, Civ. A. No. 02-1232 (W.D. Pa. 2002). K & L Gates represented CMU in that litigation as well. *Id.*

yet.” (Def. Ex. 1611).²³ Additionally, Dr. Nazari’s response was confirmed through the evidence presented at trial which demonstrated that Mr. Burd did not even begin working on the Kavcic model until March 16, 2001 and the first sample chips incorporating Kavcic’s method were not delivered to Marvell’s customers until August and October of 2002. (See Pl. Ex. 227; Docket No. 678 at 198, 208, 214). As such, CMU could not possibly have constructive knowledge of infringement which had yet to even occur. See *Aukerman*, 960 F.2d at 1032. For these reasons, the 1998 email cannot be construed as providing CMU actual or constructive knowledge of Marvell’s infringement of either patent. *Id.*

Second, with respect to the evidence of CMU’s asserted knowledge of potential infringement as early as May 16, 2001, following Mr. Burd’s development of a detector based on Dr. Kavcic’s work in March of that year, and the incorporation of same into Marvell’s simulators, such evidence is likewise insufficient to trigger the presumption. To this end, the Court finds that both Dr. Moura and Dr. Kavcic credibly testified²⁴ that they did not know or believe Marvell was infringing in the 2001 timeframe. (Docket No. 874 at Ex. H at 14; Docket No. 673 at 93-99). As Dr. Moura convincingly explained, on May 16, 2001, CMU held a meeting to discuss licensing targets where CMU identified Marvell and commented that several

²³ The Court notes that Dr. Nazari is a former Marvell employee but he was neither called as a witness at trial nor put forth as a declarant in support of Marvell’s present motion for judgment on laches. Although he was potentially subject to being used as a witness and/or declarant by both parties, the Court infers that any facts which would have been presented by Dr. Nazari on the issue of Dr. Kavcic’s awareness of potential infringement around the time of these emails would not have been favorable to Marvell; otherwise, Marvell would have presented his version of these events during trial and/or post-trial proceedings. See *ID Security Systems Canada, Inc. v. Checkpoint Systems, Inc.*, 249 F. Supp. 2d 622, 678 (E.D. Pa. Mar. 28, 2003) (quoting *Grajales-Romero v. Am. Airlines, Inc.*, 194 F.3d 288, 298 (1st Cir. 1999)) (“A ‘missing witness’ instruction is permissible when a party fails to call a witness who is either (1) ‘favorably disposed’ to testify for that party, by virtue of status or relationship with the party or (2) ‘peculiarly available’ to that party, such as being within the party’s ‘exclusive control.’”); see also *Arch Ins. Co. v. Carol & Dave’s Roadhouse, Inc.*, Civ. A. No. 11-801, 2013 WL 607829, at *4 (W.D. Pa. Feb. 19, 2013) (noting requirements to procure a missing witness instruction at trial of civil case). Indeed, such an adverse inference is appropriate here because Marvell had the opportunity to procure Dr. Nazari’s declaration after a billion dollar judgment was entered against it but did not do so.

²⁴ Based on the verdict in CMU’s favor, the jury obviously found Drs. Moura and Kavcic to be credible; the Court agrees that each were earnest, convincing witnesses throughout their respective testimony. See *EBC*, 2008 WL 4922107, at *4 (noting court’s requirement to “assess the credibility of witnesses” under Rule 52).

companies were “trying to find ways to avoid licensing the patent” by claiming it was “complex,” and by adding “bells and whistles” to suboptimal versions of detectors to try to “get around” the patent. (Def. Ex. 1522; Docket No. 673 at 92:22-24). Dr. Moura’s testimony was corroborated by his notes of the meeting, which likewise reflected that the purpose of the meeting was to determine potential targets for licensing the technology and do not allege or imply that any chip manufacturer, including Marvell, was possibly infringing the ‘839 Patent at that time. (Def. Ex. 1522). Email correspondence between Drs. Kavcic and Moura prior to the meeting likewise reflects that the meeting focused on potential licensing targets. Further, the Court also believes that Dr. Moura credibly explained his attempt to search for web-based documents about Marvell’s technology, which disappeared from cyberspace sometime after he briefly read them. (Docket No. 673 at 98). On this point, Dr. Moura clearly stated that the purpose of his Internet search was to determine how companies were developing ways to avoid licensing the ‘839 Patent and he was searching to find information about the products that were being developed so that they could attempt to market their “optimal solution” to these manufacturers. (*Id.*). In all, the Court holds that the awareness of the possibility that companies were trying to design around the technology in 2001 does not form a basis for constructive knowledge that Marvell was infringing the ‘839 Patent at that time (or the ‘180 Patent, which had yet to issue), because the very attempt to create a viable alternative to the patented technology likely constitutes, at most, an attempt to *avoid* infringement. *Cf. Muniauction, Inc. v. Thomson Corp.*, 532 F.3d 1318, 1328 (Fed. Cir. 2008) (direct infringement of a method claim only occurs if each step of the claimed method is actually performed).

To conclude, after carefully considering all of the parties’ arguments and the evidence of record, the Court holds that Marvell has failed to carry its burden of proving that it is more likely

than not that CMU knew or should have known of Marvell's infringement before March 6, 2003 or more than six years prior to the filing of this patent infringement action. *See Aukerman*, 960 F.2d at 1037. Accordingly, Marvell's Motion is denied to the extent that it requests that the presumption of laches be applied in this case and for the burden to be shifted to CMU to disprove laches.²⁵

B. Laches

As the presumption of laches has not been established, in order for Marvell to succeed in its laches defense, it must affirmatively prove that CMU: (1) unreasonably delayed the filing of this litigation after becoming aware of Marvell's infringement; and (2) that such delays caused Marvell material prejudice. *See In re Katz Interactive Call Processing Patent Litigation*, 882 F. Supp. 2d 1123 (N.D. Cal. 2010) (citing *Hemstreet v. Computer Entry Sys. Corp.*, 972 F.2d 1290, 1293 (Fed. Cir. 1992), which cited *Aukerman*, 960 F.2d at 1032) ("once the presumption is burst, the defendant must affirmatively prove both elements of laches."). Naturally, the parties contest the sufficiency of Marvell's evidence as to both prongs of this test. (Docket Nos. 804, 823, 854, 858).

1. Delay

Like the disputes on the presumption, the Court's initial inquiry is to determine *when* CMU had actual or constructive knowledge of Marvell's infringement. From this date, the Court must calculate the length of the delays in bringing the suit and ultimately decide if such delays were reasonable in light of the proffered justifications for same by CMU. *See Univ. of*

²⁵ If the presumption of laches were to apply, CMU would then have to produce evidence sufficient to support a finding of the nonexistence of the presumed facts. In other words, the patentee must show that: (1) the delay was reasonable; (2) the defendant has suffered no material prejudice because of the delay; or (3) the defendant acted inequitably. *Univ. of Pittsburgh*, 2012 WL 952849, at *2, n.1 (citing *Aukerman*, 960 F.2d at 1029). If the patentee puts forth such evidence, the presumption evaporates and the alleged infringer must then satisfy its burden of persuasion with "actual evidence." *Aukerman*, 960 F.2d at 1037-38.

Pittsburgh, 2012 WL 952849, at *3 (citing *Wanlass v. Gen. Electric Co.*, 148 F.3d 1334, 1337-38 (Fed. Cir. 1998)); *see also Aukerman*, 960 F.2d at 1037. As to the disputed date of CMU's knowledge, Marvell's position is that the evidence demonstrates that CMU had constructive knowledge of infringement in March of 2003, while CMU contends that it did not have "hard evidence" of infringement until after Marvell's '585 Patent was issued in 2005 and Dr. Kavcic (and CMU) became aware of it sometime in 2006. (Docket Nos. 804, 823).

There are no bright line rules delineating the level of constructive knowledge of an act of infringement required to trigger the laches clock because laches is an equitable defense requiring the Court to review the totality of the circumstances. *See Crown Packaging Tech., Inc. v. Rexam Bev. Can Co.*, 679 F. Supp. 2d 512, 520 (D. Del. 2010). To this end, courts have recognized that "[i]t is enough that the plaintiff has or should have 'more than a mere suspicion but less than absolute assurance of [the] alleged infringement in order to activate the laches clock.'" *Id.* (quoting *Rockwell Int'l Corp. v. SDL, Inc.*, 103 F. Supp. 2d 1192, 1197 (N. D. Cal. 2000)); *see also Intirtool, Ltd. v. Texar Corp.*, 369 F.3d 1289, 1297-98 (Fed. Cir. 2004) ("Although our precedent is clear that the patentee's constructive knowledge of an infringer's behavior can suffice to start the laches clock, it is equally clear that the patentee must have actual or constructive knowledge of an act of infringement that gives rise to a legal claim before that clock begins to run against the patentee."). While courts have concluded that "pervasive, open and notorious" infringement may be sufficient to demonstrate constructive knowledge, even in the absence of such widespread infringement, the law places an affirmative duty on patentees to police their rights and they are charged with a duty of inquiry when the facts known to the patentee "were such as to put upon a man of ordinary intelligence the duty of inquiry." *Wanlass*

v. General Elec. Co., 148 F. 3d 1334, 1338 (Fed. Cir. 1998) (citations omitted). Courts have further held that:

If a patentee knows of the existence of a product or device that (i) embodies technology similar to that for which he holds a patent and (ii) uses that similar technology to accomplish a similar objective, he has a duty to examine the product or device more closely to ascertain whether it infringes his patent. If he shirks this duty, he does so on peril of triggering the laches period and perhaps ultimately losing his right to recover damages for the infringement.

I/P Engine, 915 F. Supp. 2d at 741-42 (quoting *Odetics, Inc. v. Storage Tech. Corp.*, 919 F. Supp. 911, 918 (E. D. Va. 1996), *on remand*, 14 F. Supp. 2d 800 (E.D. Va. 1998), *aff'd in part, rev'd in part*, 185 F.3d 1259 (Fed. Cir. 1999); *see also Crown Packaging*, 679 F. Supp. 2d at n.42 (quoting same); *St. Clair Intellectual Property Consultants, Inc. v. Acer, Inc.*, --- F. Supp. 2d ----, 2013 WL 3367319, at *3 (D. Del. Jul. 2, 2013). Accordingly, these cases teach that a patentee's reasonable suspicion that its patent is being infringed requires the patentee to conduct a prompt and reasonable investigation into the allegations, and the failure to timely conduct such an investigation may result in the commencement of the laches period. *See id.*

In light of the applicable standard and after carefully considering all of the evidence presented by the parties, the Court finds that Marvell has demonstrated by a preponderance of the evidence that CMU should have known about Marvell's potential infringement of the patents as of **April 5, 2003**. Because CMU initiated this lawsuit on March 6, 2009, the period of delay in this case is approximately **five years and eleven months**.

Before addressing the reasonableness (or unreasonableness) of such a lengthy delay, the Court comments on the evidence supporting its finding that CMU had reasonable suspicions of Marvell's infringement by April 5, 2003. As of that date, CMU already possessed the information from the 2001 meeting with Dr. Moura and others, which included the disclosures

that Marvell was a licensing target for the '839 Patent and the inventors' beliefs that a number of companies were trying to design around the '839 Patent in order to avoid taking a license. (Def. Ex. 1522). Then, on the date in question, April 5, 2003, Dr. Kavcic emailed Dr. Moura that he received "two more independent confirmations" that their work was being infringed by chip manufacturers. (Def Ex. 212). Dr. Kavcic further explained that he was told by others that Marvell was among a number of "chip vendors [which were] building chips EXACTLY as you said in your autoregressive noise paper," which disclosed the inventions of the patents-in-suit.²⁶ (Def Ex. 212 (emphasis in original)). At trial, Dr. Kavcic repeatedly testified that he provided the information he received from such individuals to CMU. (Docket No. 674 at 108-110). The record further shows that after receiving this email communication, Dr. Moura, who remained at CMU, responded "great" and told Dr. Kavcic that he would "pursue it on this end." (Def. Ex. 212). Dr. Moura then passed on the information to CMU representatives (including the Technology Transfer Office and the Office of General Counsel) as is evidenced by the numerous

²⁶ The Court notes that the email reflects that Dr. Kavcic did not want to provide Dr. Moura with the names of the individuals who provided this information to him "because these people asked to remain anonymous." (Def. Ex. 212). During his trial testimony, however, Dr. Kavcic identified the individuals who provided the information to him as Rick Brandt, Brooks Wilson and Ara Patapoutian, but the record does not demonstrate whether Dr. Kavcic provided all of their names to CMU in 2003 or even at any time prior to his trial testimony. (Docket No. 647 at 108). CMU's Initial Disclosures, dated August 17, 2009, identify Dr. Ara Patapoutian as an individual with knowledge of "[e]arly disclosure of the inventions claimed in the patents-in-suit." (Docket No. 826-1 at 74). This document further identifies Dr. Patapoutian's address as Seagate Technology in Shrewsbury, MA. (*Id.*). Dr. Kavcic's 2004 memorandum to his Harvard Review committee notes that Patapoutian was then at Maxtor Corporation and that they had been involved in "collaborative activities" including "modeling the magnetic recording channel." (Docket No. 802-3 at 30). Dr. Kavcic and Dr. Patapoutian also co-authored an article about read channels in 2007, which was published in IEEE in 2008. (Docket No. 674 at 127-130). Neither of the other two individuals, Brandt and Wilson, were noted as potential witnesses in CMU's Initial Disclosures. (Docket No. 826-1 at 74). Further, Dr. Kavcic identified only Patapoutian during his deposition. (*See* Docket No. 858-1 at 8-9). Then, CMU mentions that he was the source of the rumors in its slide presentation in opposition to this motion, without referencing the other two individuals. (Docket Nos. 874-19 at 7 ("Dr. Patapoutian was a source of 'rumors' heard by Dr. Kavcic")). Accordingly, there is no evidence before the Court that CMU ever produced the names of all of these individuals to Marvell prior to Dr. Kavcic's disclosures at trial. However, despite Marvell's army of lawyers, it has not challenged CMU's untimely disclosure of these individuals in any fashion to this point. Nor did it seek to depose these individuals during trial or in the context of the post-trial laches proceedings. Therefore, the Court considers any objections to same by Marvell to be waived. *See* FED. R. EVID. 103(a)(1); *see also Government of The Virgin Islands v. Archibald*, 987 F.2d 180, 184 (3d Cir. 1993) ("If a party fails to object in a timely fashion, the objection is waived.").

privileged email communications in which he engaged with others at CMU regarding “possible infringement of patents-in-suit” in the following days, i.e., April 7, 9, 10, 11 and 12. (Docket No. 812-1 at 5-6).

While CMU claims that the information it possessed in April of 2003 was “speculative” and consisted only of “rumors” or “suspicions” and implies that such evidence was insufficient to establish a duty to investigate Marvell’s possible infringement at that time, the Court believes that the evidence CMU and the inventors possessed as of April 5, 2003 was more than sufficient to trigger a duty requiring CMU to inquire and to investigate the potential infringement by Marvell. (Docket Nos. 823, 858). CMU’s reference to “rumors,” “speculation,” and “suspicions” are largely reliant on Dr. White’s subsequent characterization of the information he received from the inventors as “rumors” in his correspondence to Dr. Kryder, which is discussed in further detail below. (Def. Ex. 213). The inventors testified using similar terms at trial but Dr. Moura even admitted that the “rumors” of infringement were “much stronger” in 2003. (Docket No. 673 at 93-99). Additionally, CMU’s privilege logs plainly establish that the inventors and CMU representatives immediately engaged in communications about “possible infringement of the patents in suit” in response to the information provided by Dr. Kavcic on April 5, 2003. (See Docket No. 812-1).

In any case, the applicable standard is not a subjective inquiry of how CMU perceived the information it possessed; rather, it is an objective, reasonableness standard, which looks at how a reasonably prudent patentee would act in response to the information. *Aukerman*, 960 F.2d at 1032. Here, the inventors acquired information from engineers working in the industry that Marvell was building chips “EXACTLY” as they had disclosed in their autoregressive noise paper and which was later claimed as their invention in the patents. The inventors then

immediately forwarded this information to CMU, which was already aware from prior discussions in 2001 that Marvell was a potential licensing target for the technology and that chip manufacturers were trying to add “bells and whistles” to the technology in order to avoid licensing it as of that time. With this information, CMU was put on notice by the inventors, both of whom are well renowned experts in the field, that Marvell: (1) was producing computer chips that embodied technology similar to CMU’s ‘180 and ‘839 Patents; and (2) that the computer chips used similar technology to accomplish a similar objective as is disclosed in the methods of the patents. *See e.g., I/P Engine*, 915 F. Supp. 2d at 741-42; *Odetics*, 919 F. Supp. at 918; *Crown Packaging*, 679 F. Supp. 2d at n.42. Because CMU had notice of these facts, the same triggered its “duty to examine the product or device more closely to ascertain whether it infringes [its] patent,” and a failure to do so may result in a determination that it “should have known” of the infringement, triggering the running of the laches clock. *Id.*

The parties next dispute the reasonableness of CMU’s investigation upon its receipt of this information. (Docket Nos. 804, 823, 854, 858). CMU asserts that its inquiry to Dr. Kryder at Seagate in 2003 and subsequent letters to Marvell were reasonable actions for it to take given all of the relevant facts at the time. (Docket Nos. 823, 858). CMU further contends that it could not have determined definitively whether Marvell was infringing without access to confidential source code and circuitry, which could not be reverse engineered given the nature of the technology and was maintained by Marvell in strict confidence under an asserted policy of secrecy. (*Id.*). Marvell argues that it has demonstrated by a preponderance of the evidence that CMU’s investigation into this information was unreasonable because it should have asserted its infringement position directly to the company rather than resting solely on its “friendly letters.” (Docket Nos. 804, 854). Marvell also adds that it would have made its chip designs and circuitry

available to CMU had it requested such information and/or asserted its infringement position at the time. (*Id.*).

Based on all of the evidence of record, the Court holds that Marvell has proven by a preponderance of the evidence that CMU's cursory inquiry to Seagate in 2003 was not a reasonable investigation under the totality of the circumstances and that Marvell has demonstrated that CMU's failure to conduct a meaningful investigation at that time is sufficient to trigger the laches clock as of April 5, 2003. See e.g., *I/P Engine*, 915 F. Supp. 2d at 741-42; *Odetics*, 919 F. Supp. at 918; *Crown Packaging*, 679 F. Supp. 2d at n.42. In this regard, it is undisputed that CMU's response to the information provided by Dr. Kavcic was Dr. White's general inquiry to Dr. Kryder at Seagate on April 10, 2003 asking whether Seagate was aware if "anyone" in the industry (without mentioning Marvell specifically) was using the Kavcic/Moura algorithm. (Def. Ex. 213). Dr. Kryder responded to this inquiry the following day, on April 11, 2003, stating, among other things, that "[w]e are not aware of anyone utilizing the claims in the Kavcic-Moura patent although channel vendors may well be working in the area of designing detectors for signal dependent noise." (Def. Ex. 214). Dr. Kryder generally explained that the claims of the patent would have to be evaluated against the chips which were being manufactured to determine if the algorithm was being used and stated that this "was not easy to do." (*Id.*). He alternatively suggested that CMU send letters to companies in the industry to advise them of the patents, counsel them that they may be infringing if they are using the patented algorithm in their chip designs and to inquire if they would like to take a license on the technology. (*Id.*). Dr. Kryder also stated in this communication that his understanding of the law was such that a party put on notice of possible infringement may be liable for increased damages. (*Id.*). Of note, Dr. Kryder's response to this inquiry did not detail any analysis of

whether Seagate believed that Marvell – which had already supplied Seagate samples of the Accused Chips to that point²⁷ – was infringing the patents, presumably because Dr. White did not identify Marvell specifically in his inquiry and downplayed the information provided by Dr. Kavcic as “rumors.” (Def. Ex. 213).

Dr. Kryder’s email to Dr. White was then circulated among representatives of CMU and the inventors. (Def. Ex. 214). Dr. White commented initially to the other individuals on the email chain that they should proceed as they had “previously discussed.” (*Id.*). However, CMU did not act on any of Dr. Kryder’s suggestions until four months later, in August of 2003, when Carl Mahler of the Technology Transfer Office sent what he termed “friendly letters” to manufacturers, including two to Marvell. (Pl. Exs. 422, 431). The “friendly letters” do not allege infringement of the patents and are best construed as marketing letters designed to notify targeted manufacturers of the patents in an apparent effort to initiate licensing negotiations regarding same. (*Id.*). It is undisputed that Marvell received such letters but did not respond to them in any fashion. Yet, Marvell’s non-response is akin to the actions of the twelve (12) other companies that received these form letters from CMU and never responded to CMU. (Docket No. 826-1 at 45-48). It is likewise uncontested that CMU did not follow up with Marvell in regard to the letters. Nor did it assert that Marvell was infringing the patents until the instant lawsuit was filed on May 6, 2009, five years and eleven months after Dr. Kavcic’s initial notification to CMU that the patents were being infringed by Marvell.

Looking objectively at all of the facts that CMU possessed on April 5, 2003, in sum, the Court believes that CMU did not conduct a reasonable investigation at that time because it did

²⁷ Marvell sold Seagate 159,544,715 Accused Chips from March 6, 2003 to July 28, 2012. On February 12, 2003, Marvell shipped sample 88C7500M chips, which contained MNP, to Seagate; Seagate placed an MAPL Order for such chips with Marvell on August 12, 2003; and Marvell sold its one millionth unit, achieving its “design win” as to this order, in January of 2005. (Docket No. 868-14, P-Demo 20).

not investigate whether Marvell was manufacturing products which infringed the ‘180 Patent (or the ‘839 Patent), which is what the relevant caselaw teaches a reasonable patentee would do upon receipt of such information. *See e.g., I/P Engine*, 915 F. Supp. 2d at 741-42; *Odetics*, 919 F. Supp. at 918; *Crown Packaging*, 679 F. Supp. 2d at n.42. Rather, CMU largely ignored the significance of the information provided by the inventors that they believed that Marvell was manufacturing chips “EXACTLY” as claimed in the patents and then made a general inquiry to Seagate about whether it could confirm “rumors” that the technology was being used by “anyone” in the “industry.” (Def. Ex. 212 (emphasis in original)). The record evidence before the Court further illustrates that CMU did not disclose to Seagate that it was Marvell that was potentially infringing; if it had, Seagate (a member of CMU’s DSSC) could have potentially investigated whether any of the sample chips it was supplied by Marvell infringed the patents and would have then been put on notice to look for any such infringement in the millions of chips it later purchased from Marvell. (Def. Ex. 213). As Dr. White noted in his letter, because Seagate had funded the development of the patents through the DSSC and possessed rights to same, it would have had a strong incentive to conduct such an investigation of Marvell’s chips. (*Id.*).

In addition, CMU did not even follow Dr. Kryder’s sound advice, which was to notify the chip manufacturers that “if they are building channel chips that incorporate algorithms for signal dependent noise, they may be violating the patents.” (Def. Ex. 214). Such an assertion would have likely provided more support for CMU’s present position, but it was not made. Instead, armed with allegations of potential infringement, brought to its attention by the inventors, CMU waited approximately four months and then sent its form “friendly letters” to Marvell asking if it was interested in licensing the patents and made no assertion of an intent to enforce the patents

through litigation or otherwise. (Pl. Exs. 422, 431). The use of letter communications to directly or indirectly assert infringement allegations against potential infringers or to warn entities of potential infringing activities is commonplace in intellectual property practice and often a cost effective and powerful tool to enforce patent rights. *See e.g., Matthews Int'l Corp. v. Biosafe Engineering, LLC*, Civ. A. No. 11-269, 2011 WL 4498935 (W.D. Pa. 2011), *aff'd*, 695 F.3d 1322 (Fed. Cir. 2012).

The record evidence also shows that over time, CMU continued to obtain additional information concerning Marvell's potential infringement from the inventors and other sources, but CMU did not change its position in any meaningful way vis-à-vis Marvell in response to this additional information. CMU also did not undertake a thorough and diligent investigation into the potential infringement until a few months before the lawsuit was filed, despite being a top-flight computer science and engineering University, with a Technology Transfer Office, (*see* Docket No. 901 at 9), and an active Office of General Counsel which had initiated patent litigation to enforce its patents against other potential infringers in the past.²⁸ (*See e.g., Carnegie Mellon University et al. v. Hoffmann-LaRoche, Inc. et al.*, 541 F. 3d 1115 (Fed. Cir. 2008); n.22, *supra* ('02 Fujitsu litigation); Docket No. 812-2 (describing confidential communications concerning other potential enforcement litigation against other entities)). The record also plainly demonstrates that the inventors believed that they had an infringement case against Marvell as early as April of 2003, (Def. Exs. 212, 246), and that they would periodically receive additional information confirming their beliefs and then promptly share such information with CMU, representatives of which would discuss the latest disclosures internally and with counsel but then

²⁸ The Court understands from presiding over these proceedings from the outset that General Counsel Mary Jo Dively, Esquire, has a background in intellectual property litigation and technology and engaged in such practice at Reed Smith prior to joining CMU in her present capacity. *See e.g.,* http://www.cmu.edu/ogc/attorneys_staff.html (last visited 1/9/14).

take no affirmative action to thoroughly investigate the alleged infringement by Marvell. (*See* Docket No. 674 at 110).

Specifically, by July of 2004, CMU had received another demand by Dr. Kavcic that a lawsuit be initiated, and was also aware from former Marvell employees that Marvell had named a “subroutine” “kavcic.c,” after him and was marketing a new line of chips (7500 series) to its customers which incorporated new technology to combat media noise. (Def. Ex. 246; Docket Nos. 816-1 at 4; 816-4 at 10-12). Indeed, Dr. Kavcic was so confident in his position that his work was being used that he told his review board at Harvard that Marvell and other notable read chip manufacturers “utilize[d] a form of the detector I proposed in their latest generations of read channel chips,” and noted that companies and research institutions were building simulators modeled after his work. (Def. Ex. 373). CMU intermittently consulted with K&L Gates as outside counsel around this time and the privilege logs plainly reflect that by March of 2005, it was discussing the “CMU/Marvell litigation” with K&L Gates. (Docket No. 812-1 at 15). Marvell’s ‘585 Patent issued in 2005, citing the CMU Patents as prior art; Dr. Kavcic and CMU became aware of Marvell’s ‘585 Patent shortly thereafter in 2006. (Def. Ex. 266; Docket Nos. 803 at ¶ 42; 825 at ¶ 42; 674 at 220-21). Later, in 2006, CMU internally estimated the potential value of Marvell’s infringement of the patents at \$2 million annually, although they apparently conducted this financial analysis without having first conducted any investigation of Marvell’s infringement or engaging a consultant or an expert like Dr. McLaughlin to evaluate potential infringement. (Def. Ex. 272; Docket No. 682 at 103). In fact, that internal document expressly states that CMU still “need[ed] to strategize and make a decision” about whether to pursue litigation. (Def. Ex. 272).

CMU counters that it conducted an “evolving analysis of the patents” between 2006 and 2008, (Docket No. 823 at 14), but Mr. Wooldridge testified that the “evolving analysis” consisted of only “preliminary discussions” to determine if more substantive discussions should take place concerning enforcement of the patents, (Docket No. 826-1 at 60). CMU’s inertia concerning the alleged infringement by Marvell continued into 2008, when the inventors attempted to obtain the patents from CMU through a release. But such efforts were rejected by CMU, prompting Dr. Kavcic²⁹ to comment that he did not believe that CMU was interested in enforcing the patents at all. (Def. Ex. 306). It was not until late 2008 that K&L Gates was more formally engaged to conduct the pre-suit investigation which culminated in the filing of this lawsuit in March of 2009.³⁰ (Docket No. 812-1 at 50; 811-1 at ¶¶ 10-12).

In this Court’s opinion, CMU’s failure to conduct anything more than a cursory investigation of infringement until late 2008 was unreasonable in light of all of the relevant facts and circumstances; particularly, the information known to CMU in April of 2003 that Marvell was building chips “EXACTLY” as Kavcic had disclosed in his paper and was claimed in CMU’s patents and the additional information it obtained thereafter, all of which should have prompted CMU and its counsel to commence a thorough investigation of the alleged infringement at that time. (Def. Ex. 212). Further, by July 2004, CMU had more than sufficient information to conduct an investigation as to whether Marvell was *willfully infringing* the patents

²⁹ For his part, Dr. Kavcic testified that he and Dr. Patapoutian co-authored an article in 2007, which was published in 2008, and that in the article he “proved” how the operation of Marvell’s ‘585 patent infringed the methods of CMU’s patents. (Docket No. 674).

³⁰ The filing of the lawsuit necessarily implies that CMU’s counsel had conducted a sufficient pre-suit investigation of the facts to make the assertions contained therein in accordance with Rule 11 of the Federal Rules of Civil Procedure and that the allegations were sufficiently factually supported under the plausibility standards set forth in *Bell Atl. Corp. v. Twombly*, 550 U.S. 544 (2008) and *Ashcroft v. Iqbal*, 556 U.S. 662 (2009). The Court further discusses the Rule 11 obligations of CMU’s counsel below. *See* p. 48-49, *infra*. The Court also notes that if CMU had filed its case closer in time to the commencement of the laches period in 2003, the heightened pleading standards of *Twombly* and *Iqbal* which did not become the law until 2009, would not have applied. In any event, Marvell filed an Answer to CMU’s Complaint and did not challenge the sufficiency of the pleadings Rule 12(b)(6). (*See generally* Docket Report, Civ. A. No. 09-290).

because to that point it: had already put Marvell on notice of the patents through its “friendly letters”; was aware of allegations that Marvell was producing chips “EXACTLY” as claimed in the patents to combat media noise; knew how the new series of chips were named, i.e., with an ID composed of several numbers and ending with 7500 and a letter; and knew that Marvell had a subroutine in its detector named after Dr. Kavcic. (Def. Ex. 212; Docket Nos. 816-1 at 4; 816-4 at 10-12; Pl. Exs. 422, 431). Indeed, these are the core facts which serve as the basis for the willful infringement allegations CMU ultimately made in its Complaint filed against Marvell on March 6, 2009. (See Docket No. 1 at ¶¶ 15, 22).

Additionally, the Court finds that the delays by CMU are inexcusable, especially when considering that its own licensee and DSSC partner, Seagate, purchased in excess of 159 million chips from Marvell (between 2003 and 2012), which possessed the infringing technology, and incorporated same into hard drives which were then sold to third parties down the stream of commerce. (Docket No. 868-14, *P-Demo 20*). As the Court noted in its decision on the marking issue, CMU’s license of the patents under the DSSC program required little of the licensees and did not meaningfully permit CMU to police the use of its patents by the licensees because it did not require the licensees to mark products or even advise CMU that the patents were being used. *CMU*, 906 F. Supp. 2d at 413. Under its licenses, Seagate was not affirmatively required to even inspect the chips it received from Marvell to determine if they were infringing the patents. *Id.* Accordingly, the Court believes that it was wholly unreasonable for CMU to rely on Dr. Kryder’s general assertion that they were not aware of anyone using the algorithm, especially when CMU did not even advise Dr. Kryder of the entities that the inventors believed were infringing, including Marvell. (Def. Ex. 213).

Moreover, the breadth of CMU's infringement case presented at trial, which alleged that Marvell produced 2.34 billion infringing chips from 2001 until 2012 (a figure which has since been updated to include sales post-July 2012 and up to November of 2013, i.e., an additional 458,143,144 chips), is such that CMU should have known about Marvell's infringement much earlier than it contends in its papers. *See Comcast v. Finistar*, No. C-06-04206, 2008 WL 170672 at *4-6 (N.D. Cal. Jan. 17, 2008). CMU's position that the infringement was not as widespread in 2003 or 2004 and did not become "industry standard" until 2005, and "must have" for Marvell until³¹ that time do not weigh in its favor because, again, CMU conducted no formal investigation into Marvell's infringement until late 2008, despite the inventors' reports of infringement in 2003 and 2004 and their various demands that a lawsuit be filed during the relevant time period. Admittedly, Marvell's sales increased exponentially over time, but the sales in 2003 and 2004 were not insignificant; rather millions of chips were sold even in this timeframe. (*See* Def. Ex. Q, *Affidavit of Dr. Sutardja* at ¶ 8, Docket No. 868 (noting Marvell's sales of 16,526,143 units in 2003; 83,031,317 units in 2004; 182,531,849 units in 2005)). In this Court's opinion, CMU had sufficient information that it should have conducted a prompt and thorough investigation of infringement much closer in time to Dr. Kavcic's reports of infringement.

³¹ Dr. Bajorek testified the technology only became industry standard in 2005 and specifically denied that it was widespread in 2003. (Docket No. 678 at 113-115, 171, 226). Prior to that juncture, the SNR gains from using the infringing MNP technology were "deemed to be pretty small." (*Id.* at 114). It was after the industry moved to perpendicular recording in 2005 that "the value of MNP ... really shined." (*Id.*). However, CMU had already been advised by Kavcic that Marvell was likely infringing prior to the exponential increase in sales that followed. In 2005, the hard disk drive industry moved to perpendicular recording and Marvell's infringing MNP chip was recognized as an effective tool for dealing with media noise. (*Id.* at 113-115, 171). Several Marvell emails related to the necessity of MNP/NLD technology including one on February 6, 2007, wherein Mr. Burd stated, "[w]e did not do comparison with linear Viterbi since now days [sic] the drives are dominated by media noise, and MNP or NLV is a must." (Pl. Ex. 607). Dr. Bajorek remarked that "once customers saw the gain, they enabled the technology and used it in that mode ever since." (Docket No. 678 at 114).

CMU suggests that it is improper for the Court to find constructive notice of infringement because of the complexity of Marvell's chips and the fact that Marvell kept its circuitry and chip designs confidential under an asserted policy of secrecy. (Docket Nos. 823, 854). Marvell responds with sworn affidavits by Dr. Sutarja and Dr. Wu, which state that they would have made the chip circuitry available to CMU had infringement allegations been made, as Marvell has shared such confidential information with competitors in the past and would have been more inclined to do so with a university. (Docket Nos. 802-1, 802-2). CMU claims that such evidence should be given little weight because such affidavits were submitted after a billion dollar verdict was won against Marvell at trial and the mammoth publicity the verdict received³² that followed, and further believes that the evidence is contrary to the testimony of Dr. Wu and others, which allegedly demonstrates that Marvell would not have been so cooperative. (Docket Nos. 823, 854).

Turning first to the legal principles, the Court holds that the cases relied upon by CMU for the proposition that the inaccessibility of Marvell's chip circuitry and its asserted policy of secrecy preclude a finding of constructive notice are distinguishable from the present circumstances. (*Id.*). To this end, although there is certainly evidence that Marvell kept its designs confidential and secret to the outside world (which is a competitive advantage sought by most companies that manufacture products, e.g., Coca Cola's secret formula referenced by Dr. Wu, *see* Docket No. 709 at 61-62), CMU has not presented any evidence that the confidentiality and/or secrecy employed by Marvell actually prevented it from investigating whether Marvell was infringing, because there is no evidence that CMU undertook anything more than a cursory investigation of whether Marvell was infringing at all in the 2003 timeframe and CMU's DSSC

³² There are numerous references to the publicity of the verdict throughout the record. (*See e.g.*, Docket No. 828-4 (Marvell's Form 10-Q)).

partner and licensee Seagate had been supplied with millions of the infringing chips by Marvell at that time. (*Id.*). In contrast, the cited cases recognized that confidentiality and secrecy policies may prevent a finding of constructive notice in situations where other compelling factors are also present, including: when a private investigator was hired by the patentee and this individual was unable to determine if infringement was occurring, or not, because of the secrecy of infringement, *see Ultimax Cement Mfg. Corp. v. CTS Cement Mfg. Corp.*, 587 F.3d 1339, 1350 (Fed. Cir. 2009); and when a patentee makes direct inquiry to the infringer, which denies the infringement allegation but then continues to infringe in secret, *see Eastman Kodak Co. v. Goodyear Tire & Rubber Co.*, 114 F.3d 1547, 1559 (Fed. Cir. 1997) (noting that Goodyear denied that it was infringing upon a direct inquiry by the patentee and maintained a policy of secrecy); *see also Union Carbide Chems. & Plastics Tech. Corp.*, 2004 WL 1305849, at *19 (D. Del. Jun. 9, 2004) (noting that patentee made direct inquiry to alleged infringer, which denied any infringement at the time, and such facts coupled with secret nature of infringing activities showed objective reasonableness).

Here, CMU did not conduct an actual investigation which was thwarted by Marvell's policies and was never misled by Marvell because it simply did not respond to the "friendly" licensing letters.³³ Thus, CMU cannot validly claim that its investigation was hindered by such policies. *See Ronald A. Smith & Assocs. v. Hutchinson Tech. Inc.*, No. 01-03847, 2002 WL 34691677, at *9 (N.D. Cal. Aug. 16, 2002) ("Significantly, Smith Associates proffers no evidence to demonstrate that its investigative efforts were impeded or thwarted by Hutchinson's trade-secret policy... Smith Associates cannot now complain that it would have been denied

³³ The Court notes that the 1998 email exchange between Dr. Kavcic and Dr. Nazari at Marvell, wherein Dr. Nazari advised that Marvell was not working on his model, was not misleading because there is no evidence that Marvell was actually working on the Kavcic Model until Burd commenced same in 2001, after the '839 Patent had issued. (Def. Ex. 1023). CMU's counsel admitted as much at the motion hearing on May 2, 2013. (Docket No. 873).

confidential information or access to inspect Hutchinson's equipment since it, in fact, never attempted to secure either..."). Additionally, CMU has not presented any significant evidence that it was aware of Marvell's confidentiality and/or secrecy policies in 2003, and the trial testimony it relies on from Drs. Bajorek, McLaughlin and Kryder on these points included facts which were not known by CMU until after the lawsuit was filed. (See Docket No. 677 at 104-105 (Dr. McLaughlin testifying that he would "need Marvell's documents or engineers to describe – to tell you how it works, what's inside it."); see also Docket No. 678 at 58, 64-65 (Dr. Bajorek testifying that "it's impossible to tell from the chip what its internal wiring is. It's just no[t] humanly possible to do that in any practical or affordable way" ... "[t]o really be able to understand what's inside a chip, you need to get a hold of the design documents for that chip and interview the engineers who worked on that chip. Something that cannot be done without a chip maker delivering that information to whoever wants to find out what is in the chip.")). For example, Dr. Kryder testified that it was "basically impossible" to conduct an investigation of infringement without some assistance from Marvell and its engineers, among other things. (Docket No. 682 at 50). Yet, there is no evidence that this was communicated to CMU at that time or even before the lawsuit was filed, as Dr. Kryder's letter merely advised Dr. White and CMU that "it was not easy" to conduct such an investigation. (Def. Ex. 214). Dr. Bajorek and Dr. McLaughlin testified similarly; but again, these were experts retained by CMU in the context of this litigation which was not initiated until 2009. (See Docket No. 677 at 104-05; see also Docket No. 678 at 58, 64-65).

The Court likewise agrees that CMU's admission that it filed the instant lawsuit without first obtaining access to the confidential circuitry and proprietary information undermines its position on these points. See, e.g., *Beam Laser Sys., Inc. v. Cox Commc'ns, Inc.*, 144 F. Supp. 2d

464, 470-71 (E.D. Va. 2001) (rejecting plaintiff's argument that it needed discovery of non-public information where plaintiff filed suit without such information); *I/P Engine*, 915 F. Supp. 2d at 747-48. Indeed, the pre-suit investigation conducted by its counsel from late 2008 through filing on March 6, 2009 allegedly took 711.8 attorney hours, cost \$350,000.00 and was completed over a period of a few months. (Docket No. 811-1 at ¶¶ 10-12). The lawsuit was then filed by CMU's counsel alleging that Marvell was willfully infringing the patents without CMU or its attorneys having sought or gained access to Marvell's confidential and/or proprietary information. (*Id.*; see also Docket No. 804 at 13). By filing its Complaint, CMU's counsel was affirming that it had made the necessary pre-suit investigation to support not only its allegations of infringement but of willfulness as well and they were able to do so without reviewing any of the confidential and/or proprietary materials. See *Ultimax Cement Mfg. Co.*, 587 F.3d at 1339; see also FED. R. CIV. P. 11(b).³⁴ In any event, because CMU admits that it was able to conduct a pre-filing investigation of this magnitude, the real issue is whether CMU's decision to not commence this investigation until late 2008 was reasonable and whether the delays should be excused.

The parties also debate whether CMU was required to notify Marvell of its alleged infringement at any time prior to filing the instant lawsuit. (Docket Nos. 804, 823, 854, 858). CMU is correct that there has been no clearly established rule set forth by the Federal Circuit (or any other court) which absolutely requires a patentee to make an infringement allegation prior to bringing suit, as the Federal Circuit has emphasized "equitable flexibility" in evaluating all relevant facts of the situation. See *Hemstreet*, 972 F.2d at 1293 (quoting *Aukerman*) ("*Aukerman*

³⁴ By presenting a filing to the court, an attorney certifies that to the best of his or her knowledge, information, and belief formed after an inquiry reasonable under the circumstances, "the factual contentions have evidentiary support or, if specifically so identified, will likely have evidentiary support after a reasonable opportunity for further investigation or discovery." FED. R. CIV. P. 11(b)(3).

restores equitable flexibility: ‘The equities may or may not require that the plaintiff communicate its reasons for delay to the defendant.’”); *see also Aukerman*, 960 F.2d at 1034 (“In the simplest or purest form of laches, there need be no direct contact between the plaintiff and the defendant from the time the plaintiff becomes aware of its claim until the suit.”). As is discussed above, the proper test requires an objective inquiry into whether the patentee acted reasonably in light of all of the circumstances. *Id.* Here, it is undisputed that, despite all of the evidence of potential infringement it possessed, CMU never made such a direct inquiry of infringement to Marvell prior to filing suit. While such facts are not dispositive, they must still be considered by the Court among the totality of the circumstances to determine if CMU acted as a reasonable patentee. The failure to directly assert infringement does not weigh in CMU’s favor.³⁵ *Id.*

Another point of contention between the parties is whether Marvell would have set aside its confidentiality and secrecy policies and granted CMU access to its chip circuitry and designs if its infringement allegations had been made directly to Marvell. (Docket Nos. 804, 823, 854, 858). Of course, this debate surrounds a completely hypothetical situation because CMU never approached Marvell with any such infringement allegations, but only sent its “friendly” letters in an effort to engage in licensing negotiations. (*See* Pl. Exs. 422; 431). Marvell has submitted the affidavit of Dr. Sehat Sutardja, wherein he states, under penalty of perjury, as follows:

13. If CMU had approached Marvell prior to initiating this lawsuit and requested information relevant to CMU’s instant claims of infringement, Marvell would have provided sufficient information to allow CMU to evaluate its claims under a Non-Disclosure Agreement (NDA).

³⁵ It would appear that CMU’s strategy to forego allegations of infringement enabled it to avoid being sued for declaratory judgment in the Northern District of California, where Marvell is based and CMU operates a branch campus. *See e.g., Matthews Int’l Corp. v. Biosafe Engineering, LLC*, Civ. A. No. 11-269, 2011 WL 4498935 (W.D. Pa. 2011), *aff’d*, 695 F.3d 1322 (Fed. Cir. 2012). As a consequence, CMU was able to control the litigation by bringing the infringement suit here in its home forum and later successfully defended Marvell’s motion to transfer the case to the Northern District of California, which was denied by the Court. (*See* Docket No. 54).

14. While engaging in licensing discussions with other companies, Marvell has presented information regarding the operation of Marvell's products. I have reviewed several sets of slide presentations that Marvell shared in 2009 with its competitor Freescale, labeled "Subject to Fed. R. Evid. 408" and "*CONTAINS CONFIDENTIAL MARVELL INFORMATION*," because the slides include confidential information regarding the operation of Marvell's products and the particular accused circuitry. Of course, Marvell would have been more inclined to share confidential information with a university, as opposed to a competitor. Because of this, I would have approved the sharing of confidential information regarding our circuitry with CMU under an appropriate NDA.

(Docket No. 802-1 at ¶¶ 13-14). CMU cites evidence from the trial record in an effort to undermine these statements, but has pointed to no evidence which directly counters the facts that Marvell actually shared its confidential circuit designs with a competitor under a pre-litigation non-disclosure agreement ("NDA") or the assertion that Marvell would be more willing to enter into such an NDA with a university rather than a competitor. (*See e.g.*, Docket No. 707 at 95-96 (Dr. Sutardja responding affirmatively that Marvell wants to keep its chip designs secrets and shields such designs from its customers); Docket No. 709 at 61-64 (Wu testifying); *Depo of Burd 6/10/10* at 428-429). CMU opposed Marvell's request for a hearing on its laches defense and also declined the Court's invitation to depose Dr. Sutardja and Dr. Wu concerning the facts set forth in their affidavits. (Docket Nos. 778, 780, 781). As such, CMU has not directly challenged the affiants on these facts, despite opportunities for cross-examination.

Overall, the Court agrees with CMU's general assertions that the post-trial affidavits should be viewed with some skepticism, but the Court does not believe that the credibility of Dr. Sutardja's statements in same have been fully undermined and finds that Marvell would have likely been amenable to entering into an NDA with CMU if it had been approached at some point between 2003 and 2009. (Docket No. 802-1 at ¶¶ 13-14). But, again, CMU did not make

any direct infringement allegations or request that it be granted access to Marvell's confidential circuit designs prior to filing the lawsuit. *See Smith & Assoc.*, 2002 WL 34691677, at *9.

CMU further posits that the delays were reasonable because the decision to file suit needed to be made by individuals at the top of the university's administration and the same required careful deliberation about a matter outside of its core competencies. (Docket Nos. 823, 858). Nevertheless, courts have held that a corporate entity's strategic indecision of whether to file a lawsuit due to corporate bureaucracy and management changes is not sufficient to demonstrate that the entity acted as a reasonably prudent patentee, *see I/P Engine*, 915 F. Supp. 2d at 741-42 (strategic indecision by Lycos caused by ownership and management changes not sufficient), and the fact that an investigation is potentially expensive or complicated is likewise not sufficient to make lengthy delays reasonable, *see St. Clair Intellectual Property Consultants*, 2013 WL 3367319, at *3 (rejecting position that "efforts were made to conduct the analysis and the type of analysis was expensive, time-consuming, required particular expertise, and was heavily reliant upon the public availability of information on the design of computer components and the particular implementations of those components by computer manufacturers"). Given this precedent, the Court does not believe that CMU's status as a non-profit university engaged in matters outside the scope of its core competencies (i.e., educating students and conducting research) which was faced with a potential complex and expensive investigation of Marvell's infringement, suffices to demonstrate reasonableness here. *Id.* To the contrary, throughout this case CMU has touted its DSSC program, through which it partners with industry leaders such as Seagate, and within which Drs. Kavcic and Moura developed the instant technology, as an important part of its mission. (Docket No. 678 at 25, 27, 41-44). CMU operates a Technology Transfer Office and owns a substantial portfolio of patents. (Def. Ex. 272). Moreover, CMU has

enforced its patent rights through litigation in the past, including the suit brought against Fujitsu in this jurisdiction to enforce the B2 Patent, using some of the same attorneys who appear in this litigation as counsel in that case. *See CMU v. Fujitsu Ltd, et al.*, Civ. A. No. 02-1232 (W.D. Pa. 2002).

In any event, having presided over this matter from the outset, and after considering all of the evidence on these issues, the Court believes that the delays in filing suit were more likely than not attributable to a strategy by CMU to: (1) send out the “friendly letters” in order to notify Marvell of the patents³⁶; (2) avoid the front-end costs (financial and administrative) associated with investigating the possible infringement of the patents and litigation of same at that early juncture; and (3) “wait and see” how Marvell’s chips performed in the marketplace prior to making the ultimate value judgment of whether pursuit of the instant lawsuit was economically viable.³⁷ The record also demonstrates that CMU was unwilling to invest the \$350,000 it ultimately paid to K&L Gates for a pre-suit investigation until after Marvell’s products became wildly successful between 2003 and 2008 and it had become the market leader, with approximately a 60% market share. (Docket Nos. 707 at 122; 811-1 at ¶¶ 10-12). Up to that point, CMU was “pennywise and pound foolish” because it was only willing to commit limited internal resources and seek free information from Seagate in response to its general inquiry. These sources provided CMU with inaccurate information concerning both whether the patents were being infringed (i.e., Dr. Kryder’s assertion that he was not aware that “anyone” in the industry was using the patented methods in 2003) and the potential value of such infringement (i.e., Mr. Wooldridge’s “highly speculative estimate” of the value of the infringement at \$2

³⁶ As Dr. Kryder advised Dr. White in his letter, by notifying Marvell of the patents, CMU preserved a potential claim for willful infringement and possible treble damages. (Def. Ex. 213).

³⁷ As the Court has commented on several occasions, it also appears that CMU was perhaps more interested in Marvell supporting its DSSC and/or its efforts to expand its branch campus in Silicon Valley. In fact, at various stages the Court suggested such partnership in an effort to resolve this dispute.

million annually in 2006, a figure which pales in comparison to Ms. Lawton's later valuation and the jury's verdict). (Def. Exs. 213; 272). It was CMU's decision to pursue these avenues for information, and it relied on same to its own detriment. Simply put, CMU should have done more to timely investigate the infringement allegations, and its failure to act reasonably leaves its pre-suit damages award vulnerable to a well-supported laches defense.

CMU points out that certain courts have recognized that a four year delay between the patentee's receipt of actionable information and the filing of an infringement lawsuit is not *per se* unreasonable. *See e.g., IXYS Corp. v. Advanced Power Technology, Inc.*, 321 F. Supp. 2d 1156, 1163 (N.D. Ca. Jun 16, 2004) (citing cases). Marvell counters that other courts have found that laches bars damages for delays of even shorter time periods, such as two or three years. *See e.g., Altech Controls Corp. v. E.I.L. Instruments, Inc.*, 33 F. Supp. 2d 546, 554 (S.D. Tex. 1998) (delay of approximately two years and three months); *Odetics*, 919 F. Supp. at 923-24 (delay of three years). The Court acknowledges that other courts have reached various conclusions about the length of the delays needed to establish laches after analyzing the facts in individual cases but reiterates that the delay in this case of five years and eleven months was nearly long enough to invoke the presumption of laches, *cf. Altech Controls Corp. v. Eli Instruments, Inc.*, 8 F. App'x 941, 951 (Fed. Cir. 2001) (upholding the district court's grant of laches when "[t]he delay in filing suit was five years and ten months, only two months shy of the six-year presumptive period."), and its decision that CMU's delays during this time period were unreasonable and inexcusable was reached after conducting a fact intensive inquiry concerning CMU's failure to act in this case rather than the adoption of any *per se* rules.

In sum, after carefully considering all of the facts in the record, the Court holds that Marvell has proven by a preponderance of the evidence that CMU's delays in filing this lawsuit

were unreasonable and inexcusable under the first prong of the laches analysis. *See Aukerman*, 960 F.2d at 1032.

2. Material Prejudice

The Court now turns to the contested issue of whether Marvell has proven by a preponderance of the evidence that it was materially prejudiced by such delays. (Docket Nos. 804, 823, 858, 858). Material prejudice may be shown on the grounds of economic or evidentiary prejudice. *Aukerman*, 960 F.2d at 1033. Marvell alleges that it has presented sufficient evidence as to both of these forms of prejudice, and the Court will evaluate the parties' positions as to each type of prejudice, in turn.

a. Evidentiary Prejudice

With respect to evidentiary prejudice, Marvell argues that CMU's delays caused the loss of potentially favorable documents from the inventors Dr. Moura and Dr. Kavcic, the fading of memories of witnesses, including the patent prosecution attorney, Jonathan Parks, Esquire, as well as the death of one of its experts, Dr. Jack Wolf, who would have testified as to his opinion that CMU's patents were invalid. (Docket No. 804 at 20-22). CMU counters that Marvell has not met its burden to demonstrate prejudice because the cited evidentiary losses are too general and concern immaterial matters. (Docket Nos. 823, 858). CMU further maintains that Marvell has failed to demonstrate a sufficient nexus between the unavailable evidence and the ability to defend, because Marvell could have further developed the record during discovery. (*Id.*).

It is well-settled that "[c]onclusory statements that there are missing witnesses, that witnesses' memories have lessened, and that there is missing documentary evidence, are not sufficient" to establish evidentiary prejudice. *Meyers v. Asics Corp.*, 974 F.2d 1304, 1308 (Fed. Cir. 1992). Instead, the infringer must point to specific evidence that was unavailable to it and

demonstrate a nexus between such evidence and how its absence hindered its ability to defend the lawsuit or prove a separate claim. *Id.*; see also *Hearing Components, Inc. v. Shure Inc.*, 600 F.3d 1357, 1376, 94 U.S.P.Q.2d 1385 (Fed. Cir. 2010) (“Regarding evidentiary prejudice, Shure asserts that because of the delay in suit, evidence of further delay to prove the laches defense itself was lost. . . . But evidentiary prejudice must consist of some separate disadvantage resulting from the delay, such as loss of records, unavailability of evidence, etc., that prevents a party from proving a separate claim or defense.”). As noted in *Aukerman*, the infringer must show that the missing evidence prevented it from presenting a “full and fair defense on the merits,” “thereby undermining the court’s ability to judge the facts.” *Aukerman*, 960 F.2d at 1033.

Here, Marvell has pointed to specific evidence that it was unable to present at trial to defend CMU’s infringement claims and/or to submit in support of its invalidity defenses. Specifically, CMU did not produce Dr. Moura’s notebooks from the time period between 1996 and 2000 and Dr. Moura admitted that these notebooks were either discarded due to the passage of time or were lost when he had moved offices. (Docket No. 673 at 121-122). Additionally, Dr. Kavcic did not produce any emails from his CMU/Harvard or personal accounts during 1996-2000 regarding his work on his media-noise detector as these materials could not be recovered. (Docket No. 803 at ¶ 6). Further, the prosecution attorney, Mr. Parks, could not recall basic facts about the patents by the time his deposition was taken during the pendency of this case.³⁸ (*Id.*). Finally, one of Marvell’s invalidity expert witnesses, Dr. Jack K. Wolf, passed away following a battle with cancer on May 12, 2011 at the age of 76. (Docket No. 220 at Ex. 9).

³⁸ Marvell also argues that it was prejudiced because certain other witnesses, including Dr. Kryder and Mr. Wooldridge, were unable to recall certain facts, a position which CMU also contests. (Docket Nos. 804, 823, 854, 858). The Court need not address these issues given its finding that the other evidence cited by Marvell did cause it to be prejudiced.

In opposition, CMU cites the facts that Dr. Kavcic's 1998 email to Dr. Nazari at Marvell about his GLOBECOM 98 paper was included in the record (although not produced by Kavcic) and that several emails from Dr. Moura in the same time period were likewise included. (Docket No. 826-1, Pl. Exs. 3-6). CMU also avers that Dr. Kavcic's emails while he was at CMU would have been purged in the normal course a few months after he earned his Ph.D and that there is no evidence of record that any other emails on these issues existed. (Docket Nos. 823, 858). Nonetheless, CMU has not supported its assertions with any evidence such as affidavits from the inventors assuring the Court that there were no relevant emails, or notes in Dr. Moura's notebooks that could have been discovered. (*Id.*). CMU failed to even respond to Mr. Parks' inability to recall information about the prosecution of the patents. (*Id.*). CMU contests Marvell's claim of prejudice due to the death of Dr. Wolf because his opinions about the "tap weight theory" were rejected by the Court at summary judgment and it presented the testimony of well-qualified experts in the field at trial, such as Dr. Proakis and Dr. Blahut and its own Dr. Wu. (*Id.*). CMU also posits that Marvell could have cured any prejudice it may have encountered by taking depositions of additional potential witnesses who were disclosed by CMU during discovery.³⁹ (*Id.*).

In this Court's opinion, Marvell has demonstrated by a preponderance of the evidence that it was prejudiced by the lack of such evidence and that the absence of same hindered its ability to defend the case, particularly with respect to its affirmative defense of invalidity. *See Meyers*, 974 F.2d at 1308. At the outset, the Court agrees with Marvell that CMU overreaches in its position that Marvell must be able to absolutely demonstrate that the missing evidence would

³⁹ The Court generally agrees that there were more than a few individuals who should have been deposed by both sides, including, among others, Attorney Mahler and the informants who provided information to Dr. Kavcic. But it does not appear that deposing any of these potential witnesses could have filled the gaps in the missing evidence from Dr. Moura's notebooks or the inventors' emails.

have changed the outcome of this case. The Court does not believe that the relevant standard is so taxing, but requires that the infringer show that it was disadvantaged in proving its case by the lack of evidence, *see Hearing Components*, 600 F.3d at 1376, “thereby undermining the court’s ability to judge the facts,” *Aukerman*, 960 F.2d at 1033. Marvell has met this burden.

The Federal Circuit has recognized that evidence which is lost due to an *infringer’s* operation of its own standard business practices to destroy materials after a certain period of time can be sufficient to demonstrate evidentiary prejudice. *See Wanlass*, 148 F.3d at 1340 (holding that infringer’s destruction of evidence under its own standard business practices, among other things, helped to demonstrate evidentiary prejudice); *see also Altech Controls Corp. v. Eil Instruments, Inc.*, 8 F. App’x 941, 951 (Fed. Cir. 2001) (“EIL presented evidence of evidentiary prejudice because it has a policy of shredding invoices after five years.”). Accordingly, it reasonably follows that a *patentee’s* destruction of evidence under its own policies or otherwise which may have been relevant to the defense but is now unavailable can likewise support a finding of evidentiary prejudice. *Id.* Here, the inventors’ missing documents from the 1996-2000 timeframe were never in Marvell’s custody or control and it was CMU’s duty to preserve⁴⁰ such evidence in its possession (and to instruct the inventors to retain and preserve such information in their possession) in the event that CMU sought to litigate its patents. Further, the inventors have a financial stake in the patents and this litigation. (Docket No. 671 at 194-195). They were aware of suspicions of companies “trying to design around” the patents in 2001 and were very much pushing CMU to pursue litigation of the patents as early as 2003. (Docket No. 673 at 93-99). Not only should CMU have done more to investigate the infringement allegations around that time, but it also should have taken affirmative steps to preserve evidence. *See*

⁴⁰ “The duty to preserve evidence begins when litigation is pending or reasonably foreseeable.” *Micron Tech., Inc. v. Rambus, Inc.*, 645 F.3d 1311, 1320 (Fed. Cir. 2011) (quotation omitted). Litigation may be reasonably foreseeable if, among other facts, the patentee has “knowledge of likely infringing activity by particular parties.” *Id.*

Micron Tech., Inc. v. Rambus, Inc., 645 F.3d 1311, 1320 (Fed. Cir. 2011). Further, despite Marvell’s production of evidence in support of its claim of material prejudice, CMU has not presented *any* evidence of steps that were taken to preserve such evidence during the laches period of 2003 to 2009. (See Docket Nos. 823, 858).

It is also more than reasonable for the Court to infer that there were likely relevant emails from Dr. Kavcic and Dr. Moura that were never discovered or produced by CMU from the 1996-2000 timeframe. The record is replete with emails from both Dr. Moura and Dr. Kavcic after 2000 and up until trial, and they both obviously communicated by email quite often about the patents given their scientific backgrounds. (See *e.g.*, Def. Ex. 189 (the “Silvus” email)). Plus, the inventors have not disavowed the existence of any such relevant communications, despite the Court’s invitation to both parties to present affidavits as to this Motion. (See Docket No. 781). Dr. Moura also admitted that his notebooks from that time period could have contained information about the methods which were ultimately patented. (Docket No. 673 at 121-122). CMU acknowledges that it purged Dr. Kavcic’s emails after he moved on to Harvard, but could only estimate that they were likely destroyed within three to six months of his departure (in 1998 or 1999) and could not determine if backup files had been created and/or when any such backup files were destroyed.⁴¹ *Cf. Artic Cat, Inc. v. Injection Research Specialists, Inc.*, 362 F. Supp. 2d 1113, 1122 (D. Minn. 2005) (finding an “inventor notebook” among missing evidence supporting determination of evidentiary prejudice). Likewise, Dr. Moura did not provide any evidence as to the timeframe in which he lost his notebooks. (Docket No. 673 at 121-122). Nor

⁴¹ The Court seriously questions why CMU would treat Dr. Kavcic’s email account under its standard policy requiring it to be purged in the manner that it does for any other student or staff member of the university. (Docket No. 858-1 at 28). Dr. Kavcic was not an undergraduate student or typical staff member; he was a Ph.D candidate conducting cutting-edge research under the DSSC and joined with Dr. Moura to create an invention about complex technology. (Docket No. 673 at 42, 149). In fact, CMU had filed patent applications in 1998 for the technology before Dr. Kavcic left CMU for Harvard. (Pl. Ex. 1; Docket No. 673 at 149). It certainly should have taken steps to preserve his emails, at least those with respect to this invention.

has CMU presented any evidence concerning when Dr. Kavcic's personal and/or Harvard emails from 1996-2000 were lost and/or destroyed. (Docket Nos. 823, 854). Thus, the precise content of the documents which were lost and/or destroyed by Drs. Kavcic and Moura is unknown, through no fault of Marvell, and it is more likely than not that the missing evidence could have been recovered during the laches period (from 2003 to 2009) had CMU more timely sought to enforce its rights in this case. *Aukerman*, 960 F.2d at 1033. Therefore, a sufficient nexus between the lost evidence and the delays has been established. *Id.*

The Court next finds that any emails from the inventors and Dr. Moura's notes during the period of the invention (1996-2000) may have been relevant to Marvell's invalidity defenses of obviousness and anticipation in light of the Worstell Patent. (Docket Nos. 13, 116). Likewise any evidence which could have been provided by Mr. Parks as the patent prosecution attorney and the expert testimony of Dr. Wolf may have been relevant to these defenses. As the Court recounted in its Memorandum Opinion of September 23, 2013, both parties presented expert testimony on such issues (Dr. McLaughlin on behalf of CMU and Dr. Proakis and Dr. Blahut on behalf of Marvell), and relied upon documents such as those that are described above as well as evidence from the prosecution of the patents. (Docket No. 901). While Dr. Proakis and Dr. Blahut ably substituted for Dr. Wolf,⁴² making his absence less prejudicial, the other missing evidence could have been persuasive evidence that the jury may have considered during their deliberations.

Drs. Kavcic and Moura testified at length during trial about their creation of the patented methods and their credibility was squarely at issue such that any of these missing documents

⁴² The Court also notes that Marvell could have made greater efforts to secure a trial deposition of Dr. Wolf prior to his unfortunate passing. *See* FED. R. CIV. P. 30(b)(3) ("testimony may be recorded by audio, audiovisual, or stenographic means."). However, Dr. Wolf's passing in May of 2011 was well before the close of expert discovery in April of 2012.

could have been used for cross-examination. *See Aukerman*, 960 F.2d at 1035 (“our experience, which appellant invokes, has been that testimonial evidence is frequently critical to invalidity defenses.”). Mr. Parks was not even called as a witness at trial, presumably because of his inability to provide anything of substance during his deposition, which was taken on July 21, 2010, (*see* Docket No. 854-5), while courts have recognized that evidence from patent prosecution attorneys is typically highly relevant to invalidity defenses. *See Thomas v. Echostar Satellite L.L.C.*, 2006 WL 3751319 at *3-4 (W.D.N.C. Dec. 19, 2006). Here, the privilege logs produced by CMU disclose that Mr. Parks was with K&L Gates (and its predecessor) from at least 1997 until 2007. (Docket Nos. 812-2). In addition, CMU has withheld privileged communications between its representatives and Parks, who was allegedly providing legal advice to CMU concerning the maintenance of the ‘180 Patent during the laches period and as late as April, August and November of 2005. (*See* Docket No. 812-2 at 10-11). Obviously, had CMU proceeded with this litigation in a more timely fashion, Mr. Parks’ testimony could have had an impact on this case, but like the missing emails and notebooks, this Court is unable to judge the substance of such unknowns. *See Aukerman*, 960 F.2d at 1033.

For these reasons, the Court holds that Marvell has sufficiently demonstrated by a preponderance of the evidence that CMU’s delays in this case caused it evidentiary prejudice.

b. Economic Prejudice

With respect to economic prejudice, Marvell claims that CMU’s delays in bringing this lawsuit have corresponded to its substantial monetary investments in its infringing MNP technology and the integration of same into its EMNP and NLD/NLV lines of chips, which were developed at later points in time during the laches period. (Docket Nos. 804, 854). Marvell also cites the significant capital investments which were made to support these very successful

product lines, including an exponential increase in employees and the overall size of its operations. (*Id.*). CMU argues in opposition that Marvell's investments in the infringing technologies resulted from its own decisions to capitalize on business opportunities and that it has not demonstrated an appropriate nexus between the financial investments it made and CMU's delays in filing suit. (Docket Nos. 823, 858).

The Federal Circuit has held that economic prejudice "is likely to be a slippery issue to resolve" but it may exist "where a defendant and possibly others will suffer the loss of monetary investments or incur damages which likely would have been prevented by earlier suit." *Aukerman*, 960 F.2d at 1033. "It is not enough that the alleged infringer changed his position—i.e., invested in production of the allegedly infringing device." *Hemstreet*, 972 F.2d at 1294 (citing *Aukerman*, 960 F.2d at 1033). "A nexus must be shown between the patentee's delay in filing suit and the expenditures; the alleged infringer must change his position 'because of and as a result of the delay,'" *State Contracting & Eng'g Corp. v. Condotta Am., Inc.*, 346 F.3d 1057, 1066 (Fed. Cir. 2003) (quoting *Hemstreet*, 972 F.2d at 1294 and citing *Gasser Chair*, 60 F.3d at 775), and "not simply [make] a business decision to capitalize on a market opportunity," *Hemstreet*, 972 F.2d at 1294. To this end, "the infringer must prove that the change in economic position would not have occurred had the patentee sued earlier." *Gasser Chair*, 60 F.3d at 775. However, "[a]n alleged infringer need not show economic prejudice due to *reliance upon* the patentee's delay." *Crown Packaging*, 679 F. Supp. 2d at 526 (citing *Meyers*, 974 F.2d at 1308).

In this Court's estimation, Marvell has met its initial burden to demonstrate that it made significant capital investments in its MNP, EMNP and NLD/NLV lines of chips after CMU knew or should have known of Marvell's infringement in April of 2003. *Id.* Marvell has submitted uncontroverted evidence that it would not have invested so heavily in the post-MNP

product lines or moved them into production if CMU had timely made infringement allegations or filed its lawsuit prior to 2007. (Docket No. 802-1 at ¶¶ 16-18). In this regard, the parties do not generally dispute that Marvell invested millions in research and development of its MNP technology starting before the laches period of 2003 and continuing into the laches period. Marvell then incorporated such technology into new product lines in later years, i.e., its EMNP and NLD/NLV lines of chips, the first of which were not shipped to customers until 2007. Overall, Marvell's revenues from the sale of infringing chips grew exponentially from 2001 to 2009. (Docket Nos. 802-2 at ¶ 20; 802-1 at ¶¶ 6-9). The uncontested evidence also shows that Marvell has invested considerably in human capital as it has expanded from only 735 employees in 2001 to 7,200 as of February 11, 2013, as well as incurred millions in expenses in research and development, marketing and general administrative expenses. (*Id.* at ¶¶ 7, 8). The record further demonstrates that Marvell's overall business aside from the sales of infringing chips has had significant revenue increases during this time period with exceptional financial gains which parallel the increases in chip revenues but are attributable to Marvell's other business units. (Docket No. 868-17, Def. Ex. Q at ¶ 10). Accordingly, there is sufficient evidence in the record to conclude that Marvell made capital investments in excess of the judgment in this case.

The main contested issue between the parties is whether Marvell has established a sufficient *nexus* between these capital expenditures and CMU's delays during the laches period. *See State Contracting*, 346 F.3d at 1066. Both parties have referred the Court to numerous decisions from the Federal Circuit and lower courts addressing the evaluation of economic prejudice in various factual circumstances, all of which the Court has reviewed and considered.⁴³

⁴³ See e.g., *State Contracting*, 346 F.3d at 1066; *Hearing Components*, 600 F.3d at 1376; *Gasser*, 60 F.3d at 775; *Meyers*, 974 F.2d at 1308; *Humanscale Corp. v. CompX Int'l Inc.*, Civ. A. No. 09-cv-86, 2010 WL 3222411 at * 13 (E.D. Va. Aug. 16, 2010); *Aukerman*, 960 F.2d at 1033; *Lautzenhiser Techs., LLC v. Sunrise Med. HHG, Inc.*, 752 F. Supp. 2d 988, 1004 (S.D. Ind. 2010).

(See Docket Nos. 804, 823, 854, 858). Ultimately, the Court believes that there are no cases that are directly on all fours with the facts of the instant case, and after considering the totality of the circumstances, Marvell has not demonstrated a sufficient nexus between its capital expenditures and CMU's delays. See *State Contracting*, 346 F.3d at 1066.

The Federal Circuit has recognized a fine distinction between an infringer's burden to demonstrate prejudice which *resulted from the delays*, as is required to demonstrate laches, and its burden to demonstrate prejudice *in reliance upon the delays*, which is not required as to laches (but is necessary to prove a defense of equitable estoppel, which is not at issue here). *Meyers*, 974 F.2d at 1309, n.1. To this end, the Federal Circuit has noted that:

An infringer can build a plant entirely unaware of the patent. As a result of infringement, the infringer may be unable to use the facility. Although harmed, the infringer could not show reliance on the patentee's conduct. To show reliance, the infringer must have had a relationship or communication with the plaintiff which lulls the infringer into a sense of security in going ahead with building the plant.

Id. (quoting *Aukerman*, 960 F.2d at 1043). "In this case, defendants need not show that they relied on [the patentee's] delay to establish laches. However, they must show that the prejudice they suffered resulted from the delay." *Id.* While specific proof of an infringer's reliance upon the delays is not required, several courts have found that an infringer's implied reliance on a patentee's silence after an initial threat of infringement, which is denied by the patentee, may be sufficient to prove a nexus, reasoning that the lack of any follow-up by the patentee essentially connoted an acceptance of the infringer's denials, creating a reasonable inference that the patentee had abandoned its infringement claims. See e.g., *Aukerman*, 960 F.2d at 1034 ("Where there has been contact or a relationship between the parties during the delay period which may give rise to an inference that the plaintiff has abandoned its claim against the defendant, the facts

may lend themselves to analysis under ... laches.”). However, even in these instances, the evidence may be deemed insufficient if the infringer takes a non-infringement position which it maintains throughout the case. *See e.g., Hemstreet*, 972 F.2d at 1294 (holding that infringer “apparently made a deliberate business decision to ignore that warning, and to proceed as if nothing had occurred” undermining assertion of laches). It is also noteworthy that many of the other cases cited by the parties⁴⁴ similarly involve a period of either prior litigation between the parties and/or several communications concerning potential infringement of specific products among representatives of both sides.

In this case, the evidence demonstrates that the only pre-litigation communications between the parties were the “friendly” letters sent by CMU in August of 2003 which did not allege that Marvell was infringing. (Pl. Exs. 422, 431). Importantly, Marvell was already aware of the patents well before its C.T.O. and General Counsel received these communications and there is no evidence that anyone at Marvell (including the executives in charge of Marvell’s technology and legal departments to whom the letters were addressed) ever read or considered these communications in any fashion, despite Mr. Burd’s raising a red flag on at least two occasions. (Docket No. 901; *see also* Pl Exs. 280, 283). As such, Marvell did not evaluate the business and/or legal risk associated with its production of chips containing the infringing technology in response to the letters. (*Id.*). Marvell failed to do so despite its knowledge of the importance of patent rights as is exemplified in its corporate policy articulated by Alan Armstrong, Vice President of Marketing, Storage Business Group, which required infringement allegations to be reviewed by the Legal Department, (Docket No. 761 at Jt. Ex. C at 294-295), and its promotion of patent acquisitions by the firm with vigor. Because there is no evidence that

⁴⁴ *See e.g., Gasser*, 60 F.3d at 775 (prior negotiations between parties); *Ronald A. Smith & Assoc.*, 2002 WL 34691677 at *2-3 (prior infringement allegations); *Eastman Kodak*, 114 F. 3d at 1559 (pre-suit assertion of infringement by patentee and denial of same by alleged infringer).

anyone at Marvell even read the letters, there is likewise no evidence that Marvell changed its course as a result of the letters or did so later because of CMU's lack of any follow-up. Thus, the message from CMU remained the same throughout the laches period, i.e., if Marvell was interested in licensing the patents, on equitable terms to be negotiated between the parties, it should contact CMU's Technology Transfer Office.⁴⁵ (Pl. Exs. 422, 431).

There is likewise no evidence of any changes associated with Marvell's own position vis-à-vis the patents throughout this litigation. The record demonstrates that Marvell was essentially aware of the patents upon their issuance (in 2001 for the '839 Patent and in 2002 for the '180 Patent), as is plainly evident through internal email communications by Burd and others, and Marvell's references to the patents in its provisional patent application in January of 2003 and its later application and award of the '585 Patent. (Pl. Exs. 280, 283; Def. Exs. 266, 1086). Marvell stated in its provisional patent application that Dr. Kavcic's model was too complex to implement, and claimed a suboptimal version of same, facts which laid the groundwork for its non-infringement defense at trial, i.e., the patented methods were too complex. (Def. Ex. 1086). However, both this Court and the jury have found that this was not a reasonable defense (neither subjectively reasonable nor objectively reasonable) given Dr. Wu's later communications which plainly stated that the MNP "**turns out to be the original structure that Kavcic proposed in his paper**," (Pl. Ex. 366), and other significant evidence demonstrating that Marvell knowingly copied and infringed the technology, which the Court has outlined in its September 23, 2013 decision. (See Docket No. 901). Additionally, there is no evidence that Marvell even read or considered the letter from Fujitsu which requested an opinion as to how its chips operated with respect to CMU's patents. (Docket No. 901; Pl. Ex. 474). Again, even if it had, the most

⁴⁵ In addition, even if Marvell had read and considered the letters, the only reasonable inference that could be implied by CMU's lack of follow-up would be that it was no longer interested in negotiating a license with Marvell.

reasonable inference from the evidence of record was that Marvell would have advised Fujitsu that it was not infringing because its products embodied a “suboptimal” solution to CMU’s patents, as that was Marvell’s theme at trial.

To be clear, Marvell has submitted some evidence which courts have recognized may be sufficient to lay the groundwork for a well-supported laches defense. (*See* Docket Nos. 802-1; 802-2). In this regard, the Court has considered the affidavits of Dr. Sutardja and Dr. Wu, who both affirm, under penalty of perjury, that the company would not have continued investing resources into developing the infringing technologies if CMU had filed suit between 2001 and 2007 or otherwise notified Marvell of its intent to enforce its patents against Marvell. (Docket Nos. 802-1 at ¶ 15; 802-2 at ¶ 20). Further, Dr. Sutardja and Dr. Wu each cite numerous possible alternative non-infringing products that Marvell allegedly would have invested in if CMU had raised its infringement concerns earlier during the laches period, and the Court does not dispute that Marvell could have changed its chips to implement one of these other technologies. (*Id.*). Even accepting these assertions at face value, the affidavits do not go far enough because neither Dr. Sutardja nor Dr. Wu make any real attempt to explain Marvell’s decision to continue producing chips containing the infringing technology after the lawsuit was filed and up to the present. (*Id.*). At most, Dr. Wu avers that it was too expensive to remove the infringing technologies from the chips after they were embedded in Marvell’s product lines because of its lengthy sales cycle, among other things. (Docket No. 802-2 at ¶ 26). Dr. Wu also states that the infringing technology is unnecessary to the performance of its NLD chips given its development of iterative coding, (*id.* at ¶ 21), but neither he nor Dr. Sutardja offer any evidence as to why Marvell decided to continue to include the infringing technology in the millions of

NLD chips that Marvell has sold from the date the lawsuit was filed until the present. (Docket Nos. 802-1; 802-2).

In short, Marvell's decision to continue production despite this infringement action demonstrates Marvell's apparent acceptance of the business and legal risks associated with same and further illustrates that it would not have changed its production schedule or declined to make the capital investments if the infringement lawsuit was initiated earlier. *See e.g., State Contracting*, 346 F.3d at 1067 (evidence that accused infringer would not have ceased infringing activities had the lawsuit been filed earlier counters the argument for economic prejudice); *Meyers*, 912 F.2d at 1463 (delay in filing suit does not result in prejudice when the evidence indicates that the accused infringer would have continued its activity regardless). At most, Marvell has shown that its exposure to a judgment for its infringement has grown substantially (along with its sales and revenues from the infringing chips) during the laches period and that it simultaneously made significant capital expenditures in order to support its expanding business. The same is not sufficient under Federal Circuit precedent to establish a nexus. *See Hemstreet*, 972 F.2d at 1294 ("The change must be because of and as a result of the delay, not simply a business decision to capitalize on a market opportunity.").

For these reasons, Marvell has not demonstrated a sufficient nexus between its capital expenditures and CMU's delays in this case. *Id.* Accordingly, the Court finds that Marvell has not met its burden to demonstrate economic prejudice.

3. Conclusion as to General Laches Elements

Based on the foregoing, the Court holds that Marvell has presented sufficient evidence to prove the necessary elements of its laches defense by a preponderance of the evidence, i.e., that CMU unreasonably and inexcusably delayed filing this lawsuit for a period of five years and

eleven months and that Marvell sustained evidentiary prejudice as a result. *See Aukerman*, 960 F.2d at 1033. However, Marvell has not demonstrated that it has suffered economic prejudice as a result of CMU's delays. *See Hemstreet*, 972 F.2d at 1294.

C. Equitable Considerations

The last dispute for the Court to resolve is whether the Court should decline to exercise its discretion to find laches and bar pre-suit damages for the infringement of the '180 Patent after weighing all of the equities between the parties. (Docket Nos. 804, 823, 854, 858). CMU argues that a finding of laches would be improper in this case because of Marvell's unclean hands⁴⁶ resulting from its conscious and deliberate copying of the infringing technology for more than a decade. (Docket Nos. 823, 858). Marvell advocates that the finding of willful infringement in this case is insufficient to defeat its laches defense. (Docket No. 854).

"Ultimately, the establishment of the factors of undue delay and prejudice [...] does not mandate recognition of a laches defense in every case. Laches remains an equitable judgment of the trial court in light of all circumstances." *Crown Packaging*, 679 F. Supp. 2d at 521 (citation omitted). "A patentee may [...] defeat a laches defense if the infringer 'has engaged in *particularly egregious conduct* which would change the equities *significantly* in plaintiff's favor.'" *Aukerman*, 960 F.2d at 1033 (quoting *Bott*, 807 F.2d at 1576)) (emphases added). Courts have recognized that a finding of willful infringement is not, by itself, sufficiently egregious conduct to defeat a well-supported laches defense. *Odetics, Inv. v. Storage Technology Corp.*, 14 F. Supp. 2d 800, 806 (E.D. Va. 1998) ("A mere showing of inequitable conduct on the part of the infringer, however, does not suffice to negate the effect of laches.").

⁴⁶ In this context, the doctrine of unclean hands precludes application of laches if it is demonstrated that the defendant has engaged in "particularly egregious conduct which would change the equities significantly in plaintiff's favor." *Serdarevic v. Advanced Medical Optics, Inc.*, 532 F.3d 1352, 1361 (Fed. Cir. 2008) (quoting *Aukerman*, 960 F.3d at 1038).

Further, “[c]onscious copying may be such a factor weighing against the defendant, whereas ignorance or a good faith belief in the merits of a defense may tilt matters in its favor.” *Aukerman*, 960 F.2d at 1033. The Court may also look to other factors such as: (1) the defendant’s pre-litigation conduct; (2) public policy considerations;⁴⁷ and, (3) the findings of the jury. *Univ. of Pittsburgh*, 2012 WL 952849, at *5-6.

After carefully considering all of the parties’ arguments and the evidence of record, the Court finds that the equities clearly favor CMU, which acted negligently in delaying to enforce its patents against Marvell, rather than Marvell, which copied CMU’s patents consciously and deliberately for an entire decade. *See Aukerman*, 960 F.2d at 1033. Indeed, Marvell’s knowing infringement of CMU’s patents is precisely the type of egregious misconduct which the Federal Circuit has recognized should significantly tip the scales of justice in favor of a patentee and defeat an otherwise well-supported laches defense. *See e.g., Gasser*, 60 F.3d at 775; *Bott*, 807 F.2d at 1576; *Aukerman*, 960 F.2d at 1044.

It is true that the Court has stated on the record numerous times that CMU’s delays were not fair to Marvell in the general sense, and CMU is not without fault for its unreasonable and inexcusable delays. CMU certainly had the financial wherewithal to invest in an earlier investigation of the infringement allegations that Drs. Moura and Kavcic brought to its attention and should have done so, not only to protect its own patent rights, but to defend the millions of dollars of donations, public research grants and corporate awards which funded the DSSC and the research and development of these patents in the first instance. (Docket No. 901 at 10). However, this Court does not believe that the record demonstrates that CMU engaged in

⁴⁷ The Court notes that, as is discussed in its prior decision on the JMOLs, the DSSC was established as an interdisciplinary center at CMU, funding long-term research and development through federal grants derived from taxpayer dollars, university investments and corporate sponsorships. (*See* Docket No. 901 at 10). Marvell was never a member of the DSSC and, thus, made no contributions to the technology developed by Dr. Kavcic and Dr. Moura. (*Id.*). Rather, Marvell copied the technology for its own use and has profited greatly for over a decade.

predatory behavior by secretly “lying in wait” to build a billion dollar damages case, as Marvell suggests. *See Aukerman*, 960 F.2d at 1033 (“a patentee may [not] intentionally lie silently in wait watching damages escalate.”). In fact, the evidence shows the opposite, i.e., that CMU did not fully appreciate either the value of the patented methods or the extent of Marvell’s infringement because it did not conduct a timely and thorough investigation of the inventors’ allegations against Marvell from the outset. *See* § IV.B., *supra*. CMU could be best described as naïve, timid or “gun shy” and apparently avoided raising the specter of litigation with Marvell in its initial correspondence and lack of follow-up, possibly because it viewed Marvell as a potential supporter of its research efforts or employer for its students rather than litigation target. The record also shows that CMU treated the potential infringement lawsuit against Marvell as a non-core function and focused its efforts on its core competencies of educating students, conducting research, soliciting donations and the like. But, CMU never misled Marvell nor has it engaged in any fraudulent or illegal conduct. *Id.* At most, CMU acted negligently by failing to diligently pursue its rights and by failing to retain and preserve all of the potential evidence in this case. *Id.*

For its part, Marvell seeks to invoke this Court’s equitable power to set aside a portion of the jury’s sizable damages award, but it comes before the Court with unclean hands after having engaged in deliberate and sustained copying of the patented methods throughout the entire laches period and up to the present. *See e.g., Gasser*, 60 F.3d at 775; *Bott*, 807 F.2d at 1576; *Aukerman*, 960 F.2d at 1044. In this Court’s view, Marvell’s ‘585 Patent claiming a suboptimal method to CMU’s patents was merely a “smoke screen” designed to mask its true infringing conduct from the outside world, i.e., its use of “the original structure that Kavcic proposed” in the MNP enhancement and all of its other infringing products. (Pl. Ex. 366). Marvell was fully aware of

CMU's Patents at all times and proceeded to develop such technology, without changing its behavior in any way after being notified of the patented methods by Mr. Burd, CMU, and Fujitsu. (Pl. Exs. 280, 283, 368, 366, 422, 431, 477, 823; Def. Exs. 373, 1086). Further, the evidentiary prejudice to Marvell was not so significant as to outweigh its willful conduct. Nor was its claimed economic prejudice so severe as to justify finding laches. *See* § IV.C.b.2, *supra*. In all, the fundamental tenets of equity demand that Marvell should bear the risk of loss for its egregious and illegal behavior. *See Aukerman*, 960 F.2d at 1044.

Finally, the Court also finds that public policy considerations weigh against application of laches because granting the defense in this case would reward Marvell for its claimed ignorance of the notifications by CMU and the request for an opinion by Fujitsu, and its following silence. Such a decision would likely encourage infringers to avoid responding to these types of routine communications. Public policy (as exemplified in Rule 1 of the Federal Rules of Civil Procedure and this Court's ADR Practices and Procedures) promotes the parties' pre-litigation resolution of disputes through negotiations on equitable terms, as CMU suggested in its initial letters to Marvell.⁴⁸ At the same time, because the record does not support a finding that CMU deliberately sat on the sidelines in an effort to build a billion dollar damages case against Marvell, the Court does not believe that patentees will read this decision as promoting a lack of diligence in pursuing viable patent infringement claims. Instead, patentees should understand that their pre-suit conduct will be highly scrutinized by courts in light of *Aukerman* and related precedent, and that they are expected to act responsibly toward prospective infringers.

⁴⁸ Indeed, nearly 97% of all civil cases settle at some point during litigation. Settlement efforts directed at this matter have been unsuccessful to date. With the parties' agreement, former Magistrate Judge Infante attempted to mediate this case twice, (Docket Nos. 236; 315); the Court held a lengthy settlement conference immediately before trial, (Docket No. 641); and the Court ordered the parties to Court-annexed mediation twice: once during trial, before the verdict and once before the hearing on post-trial motions. (Docket Nos. 734; 872).

Accordingly, the Court denies Marvell's defense of laches after weighing all of the evidence and the equities in this case.

V. CONCLUSION

"He who seeks equity must do equity." *Aukerman*, 960 F.2d at 1038 (citation omitted). Marvell has not acted equitably toward CMU and the Court declines to endorse its conscious copying of CMU's patented methods by sustaining its defense of laches and limiting the jury's pre-suit damages award for its infringement of the '180 Patent. Therefore, for the aforementioned reasons, Marvell's Motion for Judgment on Laches [802] is denied.

s/Nora Barry Fischer
Nora Barry Fischer
United States District Judge

Date: January 14, 2014

cc/ecf: All counsel of record